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Comparative Performance of Two Genetic Groups of Stocked Brook Trout in Maine Lakes

By: Forrest R. Bonney

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Division of Fisheries & Hatcheries

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Final Report (1997-2001)

SUMMARY

The performance of two new genetic groups of hatchery-reared brook trout was studied in eight Maine lakes from 1998 to 2001. These groups are being developed to replace the older domestic strains which, due to inbreeding, exhibited high mortality rates prior to hatch-out, and were short-lived in the wild. Paired stockings of Kennebago and Sourdnahunk fish, identified by different fin clips, were evaluated for catch rates, growth rates, and fall abundance. Anglers fished the study ponds at an average rate of 29 angler trips/ac/season, kept 0.14 fish/angler, and caught a legal-size brook trout for every 3.7 hours of fishing. The estimated harvest was equally comprised of Kennebago and Sourdnahunk fish. Older (age II+ and III+ fish) accounted for 31% of the Kennebago and 25% of the Sourdnahunk harvest. Because the older fish were heavier, Kennebago fish provided a harvest of 1.39 lb/a, compared to 0.83 for the Sourdnahunk fish. Population estimates, determined for only the three ponds with low interspecific competition, averaged 11 brook trout/ac, or 5.0 lb/ac. Older-age fish represented 17% of the number and 27% of the weight of the population. There was no difference in the incidence of hooking injuries between the Kennebago and Sourdnahunk fish. However, the Kennebago fish were more abundant, were larger than the Sourdnahunk fish and matured at an earlier age. There were differences in growth rates among ponds. Age II+ fish of both groups had a higher rate of hooking injuries than age I+ fish. Fish from a pond with an artificial-lures-only regulation also had significantly more hooking injuries than those from a pond with a fly-fishing-only regulation. Fish with hooking injuries were less robust than those without hooking injuries. For ponds with a similar number of competing fish species, older-age fish of the Kennebago and Sourdnahunk strains represented 33.5% of those captured, compared to only 4.3% for the domestic strains evaluated in an earlier study. To date, the new strains have higher hatching rates and better survival rates to older age than the domestic strains. This study is scheduled to be continued one more year.

ABSTRACT

Eight Maine lakes, located in Cumberland, Franklin, Kennebec, Oxford, and Washington counties, were studied in 1998-2000 to evaluate the performance of two new genetic groups of hatchery-reared brook trout *(Salvelinus fontinalis)*. Paired stockings of Kennebago and Sourdnahunk trout, identifiable by differential fin excision, were evaluated for returns to the angler, growth rates, and post-angling-season abundance. Anglers fished the study ponds at an average rate of 29 angler trips/ac/season (72 angler trips/ha/season), kept 0.14 fish/angler, and caught a legal-size brook trout for every 3.7 hours of fishing. The estimated harvest was comprised of 50% Kennebago fish and 50% Sourdnahunk fish. Age II+ and age III+ fish accounted for 31% of the Kennebago and 25% of the Sourdnahunk harvest. Older-age Kennebago fish were harvested at a rate of 1.39 lb/ac (1.56 Kg/ha), compared to 0.83 lb/a (0.93 Kg/ha) for the Sourdnahunk fish. Population estimates, determined only for three ponds with low interspecific competition, averaged 11 brook trout/ac (27/ha), or 5.0 lb/ac (5.6 Kg/ha). Older-age fish represented 17% of the number and 27% of the weight of the standing stock. There was no significant difference in incidence of hooking injuries by genetic group. Kennebago fish were recaptured by trapnetting at higher rates, were larger (in both length and weight), and matured at an earlier age than Sourdnahunk fish. Age II+ fish of both groups had significantly more hooking injuries than age I+ fish. The incidence of hooking injuries was inversely correlated to regulatory severity. Fish with hooking injuries had significantly lower conditions than those without. Brook trout accounted for 48% of the fish biomass in a pond with low interspecific competition, but less than 1% of the biomass in ponds with severe interspecific competition. For ponds with comparable levels of interspecific competition, older-age (ages II+ through IV+) fish of the Kennebago and Sourdnahunk strains stocked at the same age represented 33.5% of those captured compared to only 4.3% for the domestic strains evaluated in an earlier study.

KEY WORDS: AGE & GROWTH, AGE FREQUENCY, ANGLER EFFORT, ANGLER SURVEY, BIOMASS, BKT, HARVEST, K-FACTOR, LAKE, MEAN SIZE, POPULATION ESTIMATE

INTRODUCTION

Of Maine's 1,135 principal[1] brook trout lakes, 476 are dependent on stocking to provide a fishery. Over the past century, the Department of Inland Fisheries and Wildlife's hatchery system has reared several strains of brook trout to meet the stocking needs of Maine's public waters. Most of these strains, including the so-called 'Maine Hatchery Strain', originated outside of the state. Despite periodic infusions of genes through the introduction of new strains, including the Assinica strain, domestic brook trout have exhibited poor longevity and high egg mortality. A 4-year study comparing performance of the Maine Hatchery and F1 hybrid (Maine Hatchery/Assinica) strains, which have accounted for the majority of the production stocking, indicated that holdover from age I+ to age II+ was only 6 and 8%, respectively (MDIF&W 1993). Furthermore, declining and erratic rates of egg survival (Appendix 1) have rendered these strains unreliable as sources of production fish. The inbreeding and domestication of these strains is attributed to crossings made with inadequate numbers of brood fish.

In an effort to reduce egg mortality and to increase the longevity of stocked brook trout, the Department's Hatchery Division undertook a program to replace domesticated stocks with two genetic groups of wild brook trout. Both groups were taken from river drainages with few or no records of having been stocked by the Department, and emphasis was placed on acquiring enough brook trout to assure that genetic variability was maintained. Brook trout eggs have been taken from Sourdnahunk Lake, located Picataquis County, since 1995; and from the Kennebago River, located in Franklin County, since 1996. Analysis of microsatellite DNA variation confirmed that these two populations represent distinct genetic units (Bernatchez 1996). The protocol for the establishment of these two new hatchery strains stipulates that a minimum of 100 female and 100 male brook trout be mated annually from each of these waters for a minimum of three years to establish a pool of brood fish; thereafter, an infusion of wild gametes will be made every four to six years in an effort to maintain heterozygosity.

In addition to establishing two populations of brood fish, progeny of these brook trout were also stocked experimentally in selected lakes to evaluate their relative performance. This

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[1]A principal fishery is one for which the species is regularly sought by anglers and which makes up a significant portion of the catch.

report documents the relative performance of these two genetic groups of hatchery-reared brook trout.

STUDY AREA

The eight study lakes, like the majority of Maine's stocked trout lakes, are concentrated along the state's coastal lowlands and interior foothills. The physical characteristics of the study waters, which vary in size from 10 to 137 acres, approximate those of all stocked brook trout lakes less than 200 acres in size (Table 1). The number of competing fish species present in the study lakes varies from 1 to 9. A subjective index of interspecific competition was developed by assigning numeric values to other fish species based on their perceived degree of competition with brook trout (Appendix 2). Values were added and ranked proportionately on a scale of 0-10 to determine the water's degree interspecific competition. Competition severity was considered to be Low at McIntire, East and West Monroe, and Kimball ponds; Moderate at Jaybird Pond; High at Broken Bridge Pond, and Severe at Coffee and Egypt ponds (Table 2). Water quality at all of the study ponds is generally suitable for brook trout though seasonally marginal at several of the ponds (Table 3). Fishing regulations at all of the study ponds include a 2-fish bag limit. Five of the ponds have an 8-inch minimum length limit, and the other three have more restrictive length limits. The use of worms as bait is precluded at three of the ponds. Regulatory severity ranged from 3.5 (Moderate) to 7.5 (High). Regulations are considered to be of Moderate severity at five of the waters and High at the remaining three (Table 4).

METHODS

Paired stockings of Kennebago and Sourdnahunk brook trout were made from 1996-2001at a combined rate of 30-74 fall fingerlings or 6-74 spring yearlings per surface acre (Table 5). The wide range in stocking rates is typical of that statewide, and results from differences in basic productivity, interspecific competition, and angling pressure. Coffee Pond was stocked with spring yearlings due to interspecific competition which has resulted in poor survival of fall fingerlings in the past; McIntire Pond was stocked with spring yearlings due to winter kill which periodically resulted in the mortality of fish stocked as fall fingerlings; and Egypt Pond was

stocked with spring yearlings beginning in 2000 due to poor returns from the stockings of fall fingerlings. The two genetic groups were differentially marked for identification by fin excision and a representative size sample of each group was taken periodically prior to stocking (Table 6). The 1995 year class was reared at three stations. Subsequent year classes were reared at the Embden Rearing Station except that both genetic groups of the 1998 year class stocked at West Monroe Pond were raised at the Cobb Hatchery in Enfield.

Comparative catch and harvest rates were determined by season-long stratified random clerk creel surveys conducted at Egypt, Kimball, and McIntire ponds in 1998 - 2000 (Table 7). Post-fishing season population estimates by genetic group were determined by trapnetting using the Schnabel method. Efforts to determine population estimates were unsuccessful in 1997. Population estimates were successfully completed at several of the ponds in 1998 - 2000. An average of 2.3 nets were set per pond and average dates ranged from Oct. 8 to Oct. 27, or 21 days (Table 8). The generic term 'trapnet' is used throughout this report to describe the nets used for fall live brook trout capture. In fact, both Maine fykenets and fine-meshed Oneida Lake trapnets were used.

Trapnetting capture rates were compared to those for domestic strains (Maine Department Inland Fisheries & Wildlife 1993) captured at East Monroe, West Monroe, and Pineo Ponds, Hancock Co., 1988-92. These data provide the most recent and comparable source of information about the Maine Hatchery Strain and the F_1 Strain, which comprised the majority of brook trout stocked prior to the advent of the Kennebago and Sourdahunk fish.

Several project biologists informally reported better capture success with trapnets than with fykenets, which have traditionally used in Maine to capture brook trout for population estimates. Though both net types have similar form and function, Maine fykenets employ rigid metal hoops in their construction whereas Oneida Lake trapnets do not. To test relative capture rates, both net types were used at McIntire Pond from October 23 to November 1in the fall of 2000. The fykenet was moved once in an effort to improve the catch rate.

Differences in fish sizes were tested using ANOVA, *t* Test, and Duncans multiple range test. Chi square analysis was used to compare age structures. Significance level was set at P=0.05 for all tests.

RESULTS

Angler use and brook trout harvest

Anglers fished the study ponds at rates ranging from 22 angler trips/ac/season at McIntire Pond to 32 for Kimball Pond and Egypt for the 3-year period (Table 9); the average rate of use was 29 angler trips/ac/season. An earlier survey conducted at McIntire Pond in 1992 indicated a comparable use rate of 37 angler trips/ac/season. Numerically, the creel surveys indicated that equal numbers (778 Sourdnahunk and 776 Kennebago) by genetic group were harvested from the 3 ponds during the 3-year period. However, there was a difference in the proportion of older fish caught; 245 (31 %) of the Kennebago fish sampled were age II+ or age III+ compared to 195 (25%) of the Sourdnahunk fish. Size information was collected during summer clerk surveys from the three study ponds and by gillnetting from East and West Monroe Ponds from 1998-2001 (Table 10). Of the fish sampled by clerk survey, 66 (80%) were from Egypt Pond, which had the most liberal harvest restrictions. For fish sampled during the summer from all waters, Kennebago fish weighed 44% more at age I+, but weights were the same for age II+ and age III+ fish. Due to the higher proportion of older-age fish in the catch, Kennebago fish were harvested at a rate of 1.13 lb/ac, compared to 0.71 for Sourdnahunk fish.

The age at recruitment was determined by length restrictions. At Egypt Pond, which had an 8-inch minimum length limit, age I+ fish of both groups were vulnerable to harvest. At Kimball and McIntire Ponds, which have 12-inch minimum length limits, neither group was vulnerable to harvest until age II+.

Time, frequency, and relative size of brook trout captured by fall netting

Trapnetting capture efficacy increased markedly during the third week of October when water temperatures approached 50°F (10°C) and remained high through the second week of November when water temperatures neared the freezing mark. Age I+ and age II+ Kennebago fish sampled in the fall were significantly longer and heavier than Sourdnahunk fish (Tables 11 and 12). Significantly more Kennebago than Sourdnahunk were captured by trapnetting. Sixteen age II+ wild brook trout captured at McIntire Pond in the fall of 2000 are likely progeny of Anninica/Maine Hatchery Strain (Table 13). Brook trout captured at McIntire Pond, which

has low interspecific competition, tended to be significantly larger than those from Kimball Pond or West Monroe Pond (Table 14). The average sizes of age I+ fish from both groups were significantly smaller than those for domestic strains (Table 15).

A trapnet set at McIntire Pond captured a total of 102 brook trout; a fykenet set the same period captured 25 brook trout, supporting anecdotal contentions of superior catches of brook trout by trapnets. The trapnet and fykenet captured 25 and 65 creek chub, respectively, during the same period.

Brook trout population estimates and biomass by genetic group

Post-fishing-season brook trout population estimates were determined for Kimball and McIntire ponds in 1998-2000, for West Monroe Pond in 1998, and for Egypt Pond in 2000. Interspecific competition was low at all waters except Egypt Pond. Attempts to determine brook trout populations at ponds with higher degrees of competition, including Egypt, were unsuccessful with plantings of fall fingerlings. The successful population estimate at Egypt Pond followed a stocking of spring yearlings.

There was little difference in the estimates by genetic group except that age IV+ Kennebago fish were captured and age IV+ Sourdnahunk fish were not. For all waters and years, standing stock averaged 10.6 brook trout (5.0 lb) per acre (Table 16). The average abundance of age I+ fish was 7.8 (3.2 lb) per acre; age II+ fish was 2.6 (1.6 lb) per acre; age III+ fish was 0.3 (0.3 lb) per acre; and age IV+ fish was 0.1 (0.2 lb) per acre. Age II+ fish represented 24% of the number and 32% of the weight of the standing stock; age III+ fish represented 3% of the number and 6% of the weight of the standing stock.

For all waters, a significantly higher proportion of Kennebago fish was captured by trapnetting. For individual waters, significantly more Kennebagos were captured except that more Sourdnahunk fish were captured at McIntire Pond, where they were stocked as spring yearlings (Table 17). Additional sampling is necessary to determine whether capture rates by genetic group are correlated to age at stocking.

Both age I+ and age II+ Kennebago fish were significantly heavier than Sourdnahunk fish of comparable ages (Table 18). Of the age I+ fish sampled during the fall, significantly more Kennebago (84%) than Sourdnahunk (59%) were mature (Table 19). All age II+ fish were

mature. For both genetic groups, an average of 72% of age I+ fish was mature; this figure is similar to that for the domestic strain, which was 74% mature.

There were no significant differences between the genetic groups in the percent of hooking injuries observed for age I+ fish, for age II+ fish, or for all ages combined (Tables 20 and 21). However, age II+ fish (groups combined) had significantly more hooking injuries (34%) than age I+ fish (18%). For age both age I+ and age II+ fish from all study lakes, the condition of brook trout with hooking injuries was significantly lower than those without. Age I+ brook trout from Kimball Pond, which has an artificial-lures-only regulation, had significantly more hooking injuries (23%) than those from McIntire Pond (4%) , which had a fly-fishing-only regulation.

Post-stocking growth rates were obtained for both Kennebago and Sourdnahunk fish from four waters (Table 22). Growth summaries indicated that, for fish of both groups stocked as fall fingerlings, the greatest increase in lengths occurred the first year at large, when the Kennebago fish grew an average of 4.3 in and the Sourdnahunk fish grew an average of 3.9 in.; growth in subsequent years declined to 2 to 3 inches per year for both groups. However, weights increased at greater rates as fish matured. Fish stocked as spring yearlings in 2000 grew at a faster rate during their first 6 months at large at McIntire Pond (an average increase of 0.4 in and 0.8 oz for the two genetic groups) than at Egypt Pond (an average increase of 0.2 in and 0.2 oz). Weight gain of Kennebago fish exceeded that of Sourdnahunk fish (Table 23).

Netting capture rates for fish stocked as fall fingerlings declined rapidly as interspecific competition increased, and were negligible for both groups and all ages at waters with moderate to severe interspecific competition, regardless of regulatory protection (Table 24). Fish stocked as spring yearlings were captured at much higher rates (20.3% of the age I+ fish stocked were captured at McIntire vs. 4.6% at Kimball; interspecific competition is low at both ponds), but also declined in the presence of interspecific competition (0.7% at Egypt Pond). Kimball Pond has a rate of interspecific competition comparable to the Pike Brook Ponds and Pineo Pond, where capture rates of the older, domestic strains of brook trout were conducted from 1988-90. Although capture rates of age I+ fish were higher for the domestic strains (6.4 vs. 4.6%), only 0.3% of the age II+ domestic strain fish were captured, compared an average of 2.6 % for the age

II+ Kennebago and Sourdnahunk fish, some of which were also captured at ages III+ (1.2%) and IV+ (0.2%).

Brook trout biomass accounted for 48% of the total fish weight at McIntire Pond, which has low interspecific competition, but declined rapidly as interspecific competition increased; brook trout biomass was reduced to 1% or less of the total in waters with even moderate competition (Table 25). Bullhead accounted for the greatest amount of biomass, followed by suckers and minnows. The degree of competition that other species impose is demonstrated by population estimates conducted at Broken Bridge and Jaybird ponds (Table 26). Estimates of bullhead abundance indicated a population of 237 and 954 fish per acre, respectively. At McIntire Pond, creek chub abundance varied considerably but averaged 36 fish (8.0 lb) per acre, compared to 12.3 brook trout (5.4 lb) per acre.

DISCUSSION

The average angler use rate of 29 angler trips/ac/season at the study lakes exceeds that for wild brook trout ponds, which averaged 6 anglers trips/ac/season (MDIF&W 1999). The higher rate of use is attributed to the fact that the stocked ponds surveyed are located in central and southern Maine, closer to human population centers. Egypt Pond, which has liberal regulations, is managed with an emphasis on harvest. Despite differing regulations, Egypt and Kimball ponds shared the same average rate of angler use, which again may be a function of access. Kimball and McIntire ponds, with more restrictive length and gear restrictions, are managed as quality fisheries. Anglers at Egypt Pond voluntarily released fewer legal-size fish than those at the other ponds. For the 3-year survey period, creel survey data indicated that Kennebago fish outperformed Sourdnahunk fish in several areas: Kennebago fish were caught at a more consistent rate from pond to pond; a higher proportion was caught as older (age II+ and age III+) fish; and the Kennebago fish were larger at comparable ages.

Fall sampling results indicated that trapnetting propensity increases markedly as water temperatures approach 50°F. For the sake of efficiency, it is suggested that sampling be deferred until waters approach this temperature.

Post-fishing-season samples from Kimball, McIntire, and West Monroe ponds confirmed the creel survey results indicating that, despite the differences in growth rates that occur among ponds, Kennebago fish were significantly larger overall than the Sourdnahunk fish. Estimates for the number of fish per acre were similar for the two groups, indicating similar survival rates. Survival to age II+ and age III+ for both groups was significantly higher than that for the domestic strains, thus fulfilling one of the primary goals of establishing hatchery-reared strains of brook trout with the potential for greater longevity. As expected, the average size of the age I+ Kennebago and Sourdnahunk fish was less than that of the domestic strain, but an overall size advantage for these groups is expected to accrue with greater longevity. The proportion of age I+ fish that were mature (50% of the Kennebago and 55% of the Sourdnahunk) is intermediate between the 41% for 992 age I+ wild brook trout sampled statewide (MDIF&W 1999) and the 60% for the domestic strain.

Fish with observable hooking injuries had poorer condition than those without. There were also higher rates of injuries on older fish, and lower rates of injuries on the pond with a fly-fishing-only regulation than on the pond with an artificial-lures-only regulation. Because these differences have implications for the establishment of quality fisheries, additional data will be gathered at these and at the other study ponds with differing regulations for the final year of the project.

The Kennebago and Sourdnahunk fish were smaller at stocking than were those of the domestic strains. Managers' concerns that their smaller size would result in poorer survival and performance in waters with interspecific competition were confirmed by poor returns from Broken Bridge, Jaybird, East Monroe, Coffee, and Egypt ponds. Although no data exist on the performance of the domestic strains in waters with substantial interspecific competition, managers believe that, due to their larger size at stocking, they survived at higher rates during the first year than the new strains and therefore provided better returns to anglers. Hatchery managers have been moderately successful in increasing the size of the new strains prior to stocking as they become more familiar with their behavioral and nutritional needs. From 1996 to 1999, the average size of the Kennebago and Sourdnahunk fish increased 0.4 inches in length and 0.2 oz in weight.

Hatchery managers at the Phillips and Embden stations also provided information contrasting the behavior of the Kennebago and Sourdnahunk fish to that of the domestic strains. The domestic strains typically became infested with external parasites in late June, and demonstrated a 'flashing' behavior to rid themselves of these irritants. These infestations were treated with formalin. The new strains have not exhibited the flashing behavior to date, suggesting that they may be less susceptible to external parasites. The new strains have greater scatter reflexes than the old strains, and disseminate faster post-planting. Due to their wildness and greater range of sizes, the rearing of the new strains have presented challenges to hatchery personnel. They have responded by reducing the amount of light, employing automatic feeders, using a wider array of food sizes to accommodate the range of fish sizes, and by manipulating raceway densities.

This study was initiated to evaluate the relative performance of two new hatchery-reared genetic groups of brook trout in the wild. To date, survival and harvest rates of the two groups indicate that the Kennebago fish have shown superior rates of growth and survival to older ages.

The original study plan has been modified to extend the season-long creel surveys from 2 to 3 years (now completed); to abandon monitoring of those waters where brook trout survival was poor; and to conduct the fall population estimates on the remaining waters through the year 2001 to more thoroughly evaluate the longevity of the two genetic groups. These additional data will assist in meeting the stated goal of comparing the performance of these two groups of brook trout in the wild by providing information on the contribution of several year classes of fish, and their performance under differing rates of interspecific competition and regulatory severity.

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Table 1. Location and physical characteristics of stocked brook trout lakes and of 256 statewide brook trout lakes <200 acres stocked with fall fingerlings and sampled 1993-95.

Water	County	River drainage: Major	River drainage: Minor	Surface area (acres)	Depth Mean (ft)	Depth Max. (ft)	Elevation (ft)	Maximum secchi reading (ft)
Broken Bridge P	Oxford	Presumpscot	Songo-Crooked	20	12	25	794	14.0
Coffee P	Cumberland	Presumpscot	Presumpscot	137	32	70	466	35.0
Egypt P	Franklin	Kennebec	Lower Sandy	60	19	50	487	5.5
Jaybird P	Oxford	Saco	Ossipee	14	9	21	415	.
Kimball P	Kennebec	Androscoggin	Dead	55	10	19	904	5.0
McIntire P	Franklin	Kennebec	Messalonskee	20	7	20	956	9.0
Monroe P (East)	Washington	Saint Croix	St. Croix	10	12	26	270	.
Monroe P (West)	Washington	Saint Croix	St. Croix	13	11	36	270	.
Mean				**41**	**15**	**35**	**515**	**14.9**
Statewide mean of 256 brook trout lakes				**43**	**11**	**26**	**934**	**7.4 (50)**

Table 2. Competing fish species present in stocked brook trout study lakes.

Water	Competing species[2]															0-1 scale	Category
	EEL	WHS	LMB	PKL	CMS	NRD	FHM	BUL	CCB	BKF	SLT	SKB	PKS	GLS	All		
Monroe P (West)												1		5	6	0.12	Low
McIntire P									7						7	0.14	Low
Kimball P										3				5	8	0.16	Low
Monroe P (East)					3							1		5	9	0.18	Low
Jaybird P[3]								9						5	14	0.29	Mod
Broken Bridge P	6			10					7		6		6		35	0.71	High
Coffee P			9	10					7		6	1	6		39	0.80	Sev
Egypt P	6	9				2	3	9		3	6		6	5	49	1.00	Sev
All	2	1	1	2	1	1	1	2	3	2	3	3	3	5	167		

[2]BKF = banded killifish; BUL = brown bullhead; CCB = creek chub; CMS = common shiner; EEL = American eel; FHM = fathead minnow; FSD = finescale dace; GLS = golden shiner; LCB = lake chub; LMB = largemouth bass; NRD = northern redbelly dace; PKL = chain pickerel; PKS = pumpkinseed sunfish; SKB = stickleback species; SLT = rainbow smelt; WHS = white sucker

[3]PKS and WHS were documented as new species 1998; however, due to their low abundance, they are not included as competitors.

Table 3. Summer water quality values of wild brook trout study lakes and statewide means of all Maine wild brook trout lakes less than 200 acres.

Water	Date	Depth (ft)	Temp. (°F)	pH	Oxygen (ppm)	Total Alkalinity	Conductivity
Broken Bridge P	08/08/91	0	77	6.0		3	29.5[4]
		5	74				
		10	65				
		15	52		11.0		
		25	45	6.0	1.0	6	
Coffee P	07/28/94	0	73	6.2	7.8		43.5[5]
		10	64		3.4		
		16	57		3.0		
		20	55	6.0	2.5		
Egypt P	07/25/95	0	78	6.8	9.0	7	
		7	72	6.8	9.0	7	
Jaybird P	08/02/95	0	80	6.6	7.8	4	
		6	79	6.6	7.8	5	
		10	73		7.0		
		12	70		5.4		
		14	64		3.6		
		20	53		0.4		
Kimball P	07/26/94	0	77	6.4	8.0	2	20.0
		8	73	6.2	9.0	2	
McIntire P	08/17/99	0	73	6.1	7.3	3	21.0
		5	70		7.0		
		10	68		4.0		
		15	55	5.8	0.2		
		19	48		0.2		
Monroe P (East)	07/25/95	0	75	6.6	9.0	6	
		9	61	6.0	5.0	7	
		10	57.5				
		15	50				
		16	48	5.8	1.0	8	
Monroe P (West)	07/25/95	0	78	6.4	9.0		
		10	58				
		13	51	5.8	7.0	7	
		15	47				
		30	40	5.8	1.0	20	
Statewide average (sample size in parentheses)	**1993-95**	**0-10**	**65 (2136)**	**6.8 (1077)**	**8.1 (1392)**	**16.7 (584)**	**69 (192)**
		11-20	**58 (1099)**	**6.4 (426)**	**6.7 (710)**	**14.6 (150)**	**67 (48)**
		>20	**49 (1687)**	**6.4 (719)**	**4.6 (1242)**	**30.9 (248)**	**67 (73)**

[4]Mean of 11 readings taken at various depths from 1974-79.

[5]Mean of 5 readings taken at various depths in 1979.

Table 4. Brook trout regulations in effect at brook trout study lakes, 1996-2000.

Water	Minimum length limit (in)	Creel limit	Gear restriction	Regulatory severity	Regulatory category
Coffee P	8	2	NLFAB[6]	3.5	Moderate
Egypt P	8	2	NLFAB	3.5	Moderate
Monroe P (East)	8	2	NLFAB	3.5	Moderate
Monroe P (West)	8	2	NLFAB	3.5	Moderate
Jaybird P	8	2	ALO[7]	4	Moderate
Broken Bridge P	10; 1>12	2	NLFAB	5	High
Kimball P	12; 1>14	2	ALO	6.5	High
McIntire P	12; 1>14	2	FFO[8]	7.5	High

[6]No live fish as bait
[7]Artificial lures only
[8]Fly fishing only

Table 5. Stocking history of brook trout study ponds, 1996-2000.

Water	Brood year	Year stocked	Age at stocking	Genetic group	Number	No/ acre	Mark	Size at stocking Ln (in)	Size at stocking No/lb	Total weight stocked	Lbs/acre stocked	Rearing facility
Broken Bridge P	1995	1996	FF	Kennebago	400	20	RV	4-6	23.5	17	0.85	Palermo
				Sourdnahunk	400	20	LV	4-6	28.6	14	0.70	Enfield
	1996	1997	FF	Kennebago	400	20	RV-Ad	4-6	16.0	25	1.25	Embden
				Sourdnahunk	400	20	LV-Ad	6-8	9.3	43	2.15	Embden
	1997	1998	FF	Kennebago	400	20	RP	6-8	10.8	37	1.85	Embdedn
				Sourdnahunk	400	20	LP	6-8	8.5	47	2.35	Embden
Coffee P	1995	1997	SY	Kennebago	400	3	RV-Ad	6-8	7.8	51	0.37	Embden
				Sourdnahunk	400	3	LV-Ad	6-8	8.7	46	0.34	Casco
	1996	1998	SY	Kennebago	400	3	RP	6-8	6.5	62	0.45	Embden
				Sourdnahunk	400	3	LP	8-10	4.9	81	0.59	Embden
Egypt P	1995	1996	FF	Kennebago	2,200	37	RV	4-6	25.0	88	1.47	Palermo
				Sourdnahunk	2,200	37	LV	4-6	31.4	70	1.17	Enfield
	1996	1997	FF	Kennebago	2,200	37	RV-Ad	4-6	15.2	145	2.42	Embden
				Sourdnahunk	2,200	37	LV-Ad	6-8	9.4	234	3.90	Embden
	1997	1998	FF	Kennebago	1,800	30	RP	6-8	9.8	183	3.05	Embden
				Sourdnahunk	1,800	30	LP	6-8	9.5	190	3.17	Embden
	1998	2000	SY	Kennebago	2,200	37	RP-Ad	8-10	4.6	476	7.93	Embden
				Sourdnahunk	2,200	37	LP-Ad	6-8	6.2	357	5.95	Embden
Jaybird P	1995	1996	FF	Kennebago	350	25	RV	4-6	23.3	15	1.07	Palermo
				Sourdnahunk	350	25	LV	4-6	29.2	12	0.86	Enfield
	1996	1997	FF	Kennebago	350	25	RV-Ad	4-6	16.7	21	1.50	Embden
				Sourdnahunk	350	25	LV-Ad	6-8	9.2	38	2.71	Embden
	1997	1998	FF	Kennebago	350	25	RP	6-8	10.9	32	2.29	Embden
				Sourdnahunk	350	25	LP	6-8	9.7	36	2.57	Embden

Table 5. Stocking history of brook trout study ponds, 1996-2000 (con't).

Water	Brood year	Year stocked	Age at stocking	Genetic group	Number	No/ acre	Mark	Size at stocking Ln (in)	Size at stocking No/lb	Total weight stocked	Lbs/acre stocked	Rearing facility
Kimball P	1995	1996	FF	Kennebago	1,400	25	RV	4-6	25.0	56	1.02	Palermo
				Sourdnahunk	1,400	25	LV	4-6	31.1	45	0.82	Enfield
	1996	1997	FF	Kennebago	1,400	25	RV-Ad	4-6	12.4	113	2.05	Embden
				Sourdnahunk	1,400	25	LV-Ad	6-8	9.2	152	2.76	Embden
	1997	1998	FF	Kennebago	1,400	25	RP	6-8	9.7	145	2.64	Embden
				Sourdnahunk	1,400	25	LP	6-8	9.4	149	2.71	Embden
	1998	1999	FF	Kennebago	1,400	25	RV	6-8	8.2	170	3.09	Embden
				Sourdnahunk	1,400	25	LV	6-8	10.1	139	2.53	Embden
McIntire P	1996	1998	SY	Kennebago	200	10	RP	6-8	7.1	27.7	1.38	Embden
				Sourdnahunk	200	10	LP	8-10	5.1	39.3	1.96	Embden
	1997	1999	SY	Kennebago	200	10	RV	6-8	6.9	29.0	1.45	Embden
				Sourdnahunk	200	10	LV	6-8	6.3	31.7	1.59	Embden
	1998	2000	SY	Kennebago	200	10	RP-Ad	6-8	5.6	35.7	1.78	Embden
				Sourdnahunk	200	10	LP-Ad	6-8	6.1	32.8	1.64	Embden
	1999	2001	SY	Kennebago	200	10	RV-Ad	6-8	6.1	29.0	1.45	Embden
				Sourdnahunk	200	10	LV-Ad	6-8	6.9	33.0	1.65	Embden
Monroe P (East)	1995	1996	FF	Kennebago	150	15	RV	4-6	25.0	6.0	0.60	Palermo
				Sourdnahunk	150	15	LV	4-6	30.0	5.0	0.50	Enfield
	1997	1998	FF	Kennebago	250	25	RP	6-8	11.1	22.5	2.25	Embden
				Sourdnahunk	250	25	LP	6-8	10.4	24.0	2.40	Embden
	1999	2000	FF	Kennebago	250	25	RP-Ad	6-8	11.9	21.0	2.10	Embden
				Sourdhahunk	250	25	LP-Ad	6-8	13.9	18.0	1.80	Embden
Monroe P (West)	1996	1997	FF	Kennebago	250	19	RV-Ad	6-8	13.3	18.7	1.44	Embden
				Sourdnahunk	250	19	LV-Ad	4-6	8.0	31.3	2.40	Embden
	1998	1999	FF	Kennebago	250	19	RV	4-6	16.7	15.0	1.15	Enfield
				Sourdnahunk	250	19	LV	4-6	15.6	16.0	1.23	Enfield

Table 6. Mean lengths (mm) and weights (g) of brook trout reared at three Maine facilities, by age in months.

Genetic group	Rearing station	Brood year	Size variable	Age in months 5	6	7	8	9	10	11	12	13	14	15	16	17	18
Kenne-	Embden	1995	Length	63±1	81±1	102±1	128±2	147±2	160±2	164±4	168±3	173±3	.	182±2	179±2		
bago				(120)	(150)	(120)	(120)	(120)	(60)	(30)	(60)	(30)		(90)	(60)		
Weight				.	.	.	.	.	.	.	.	.	.	.	53±2		
															(60)		
		1996	Length	71±1	88±1	111±1	131±1	149±2	.	160±4	.	.	.	177±2	184±3	191±3	
				(60)	(150)	(120)	(120)	(60)		(30)				(60)	(30)	(30)	
			Weight			13	22	31	.	38							
						(120)	(120)	(60)		(30)							
		1997	Length		68±1	84±1	109±1	127±2	157±2	.	.	.	.	.	.	187	193
					(120)	(120)	(120)	(60)	(120)							(90)	(60)
			Weight		3	6	13	21	37	45	46	48	47	52	59	65	70
					(120)	(120)	(120)	(60)	(120)	(30)	(30)	(30)	(30)	(30)	(30)	(90)	(60)
		1998	Length														
			Weight														
		1999	Length														
			Weight														
	Palermo	1995	Length	.	.	.	.	.	.								
			Weight	5	10	15	27	29	31								
				(30)	(30)	(30)	(30)	(30)	(30)								
Sourd-	Embden	1995	Length	59±1	79±1	102±1	130±2	142±2	160±3	165±3	167±3	160±4	.	170±2	175±4		
nahunk				(120)	(150)	(120)	(120)	(120)	(60)	(30)	(60)	(30)		(90)	(30)		
			Weight	.	.	.	.	.	.	.	.	.	.		51±4		
															(30)		
		1996	Length	78±1	100±1	130±1	160±2	174±3	.	176±4	.	.	196±4	197±5	208±3		
				(60)	(150)	(120)	(120)	(60)	.	(30)			(60)	(30)	(60)		
			Weight	.	.	24±1	46±2	54±3	.	52±4							
						(60)		(30)		(30)							

Table 6. Mean lengths (mm) and weights (g) of brook trout reared at three Maine facilities, by age in months (con't).

Genetic group	Rearing station	Brood year	Size variable	Age in months													
				5	6	7	8	9	10	11	12	13	14	15	16	17	18
Sourd-nahunk (con't)	Embden	1997	Length	66±1 (150)	89±1 (120)	117±1 (210)	143±1 (120)	163±2 (120)						195 (90)	203 (60)		
			Weight	3 (150)	7 (120)	18 (210)	30 (120)	45 (120)	52 (30)	54 (30)	59 (30)	63 (30)	64 (60)	75 (90)	82 (60)		
		1998	Length														
			Weight														
		1999	Length														
			Weight														
Sourd-nahunk	Enfield	1995	Length	.	85 (30)	.	119 (30)	133 (30)	136 (30)								
			Weight	2 (30)	6 (30)	.	14 (30)	18 (30)	21 (30)								

Table 7. Work summary for brook trout study lakes, 1997-2001

Water	Year	Summer fishing season		Post-fishing season				
				Population estimate		Standing stock		
		Brook trout catch and harvest rates	Ages and growth rates of trout harvested	Brook trout	Competing species	Brook trout	Competing species	Age and growth rates of trout netted
Broken Bridge P	1999							X
Jaybird P	1997				X		X	X
Egypt P	1998	X	X	X		X	X	X
	1999	X	X	X		X	X	X
	2000	X	X	X		X		X
Kimball P	1998	X	X	X		X	X	X
	1999	X	X	X		X		X
	2000	X	X	X		X		X
	2001			X		X		X
McIntire P	1998	X	X	X		X	X	X
	1999	X	X	X	X	X	X	X
	2000	X	X	X	X	X	X	X
	2001			X		X		X
Monroe P (West)	1998			X		X		
	2000							X
Monroe P (East)	1999							X
	2001							X

Table 8. Post-season trapnetting schedules and associated water temperatures (°F) for brook trout study ponds, 1997-2001.

Water	Year	No. nets	Date set	Water temp.	Date pulled	Water temp	No. days	Net days[9]	Net hours[10]
Broken	1997	2	Sep 27	56	Oct 22	50	25	50	1,200
Bridge P	1998	2	Oct 5	57	Oct 26	54	21	42	1,008
	1999	2	Oct 20		Nov 3	.	14	28	672
Coffee P	1997	2	Sep 29	60	Oct 17	59	18	36	864
	1998	2	Oct 2	63	Oct 20	59	18	36	864
Jaybird P	1997	3	Sep 27	59	Oct 27	45	30	87	2,088
	1998	2	Oct 7	57	Oct 28	52	21	42	1,008
	1999	2	Oct 20	.	Nov 3	.	14	28	672
Egypt P	1997	3	Oct 8	57	Oct 31	48	23	69	1,656
	1998	3	Oct 14	54	Oct 28	52	14	42	1,008
	1999	3	Oct 27	47	Nov 18	41	22	66	1,584
	2000	3	Oct 16	54	Nov 6	46	21	63	1,512
Kimball P	1997	3	Oct 8	57	Oct 31	46	23	69	1,656
	1998	3	Oct 14	54	Nov 13	39	30	82[11]	1,968
	1999	3	Oct 20	50	Nov 15	41	26	78	1,872
	2000	3	Oct 16	52	Nov 6	46	21	63	1,512
	2001	3	Oct 16	54	Nov 9	45	24	72	1,728
McIntire P	1998	2	Oct 28	46	Nov 13	36	16	32	768
	1999	2	Oct 15	50	Nov 10	40	27	54	1,296
	2000	2	Oct 20	46	Nov 8	41	19	38	912
	2001	2	Oct 19	50	Nov 9	44	22	44	1,056
Monroe P, East	1997	2	Oct 6	.	Oct 23	.	17	34	816
	1999	1	Oct 15	.	Nov 4	.	19	19	456
	2001	1	Oct 15	58	Nov 1	.	17	17	408
Monroe P, West	1998	1	Oct 21	.	Nov 9	.	19	19	456
	2000	1	Oct 25	52	Nov 8	.	14	14	336

[9]Calendar days netted X no. of nets used

[10]Hours netted X no. of nets used

[11]The third net was set Oct 23

Table 8. Post-season trapnetting schedules and associated water temperatures (°F) for brook trout study ponds, 1997-2001 (con't).

Water	Year	No. nets	Date set	Water temp.	Date pulled	Water temp	No. days	Net days[12]	Net hours[13]
Mean	**All**	**2.3**	**Oct 8**	**54**	**Oct 27**	**47**	**21**	**47**	**1,138**
Range		**1-3**	**Sep 27-Oct 28**	**46-63**	**Oct 17-Nov 18**	**36-59**	**14-30**	**14-87**	**336-2,088**

[12]Calendar days netted X no. of nets used

[13]Hours netted X no. of nets used

Table 9. Clerk creel survey summaries for Egypt, Kimball, and McIntire ponds.

	Brook trout Genetic	Genetic	Age	Year 1998	1999	2000	All
No. anglers surveyed				396	261	355	1,012
No. angler hours surveyed				807	549	779	2,135
No. (%) anglers successful in catching a legal BKT	All		All	78 (20)	49 (19)	111 (31)	238 (24)
No. legal BKT kept	Kenn		I+	6	5	37	48
			II+	9	3	7	19
			III+	N/A	5	0	5
			All	15	13	44	72
	Sourd		I+	15	5	29	49
			II+	4	5	4	13
			III+	N/A	2	3	5
			All	19	12	36	67
	Both		All	34	25	80	139
	Other		All	14	8	11	33
	All		All	48	33	91	172
No. (%) legal BKT released	All		All	90 (65)	68 (67)	243 (73)	401 (70)
No. legal BKT caught per angler (kept + released)	All		All	0.35	0.39	0.94	0.57
No. (%) sublegal BKT	All			469 (77)	332 (76)	361(52)	1,162 (67)
No. legal BKT per angler (only those kept)	Kenn		I+	0.02	0.02	0.10	0.05
			II+	0.02	0.01	0.02	0.02
			III+	N/A	0.02	0	0
			All	0.04	0.05	0.12	0.07
	Sourd		I+	0.04	0.02	0.08	0.05
			II+	0.01	0.02	0.01	0.01
			III+	N/A	0.01	0.01	0
			All	0.05	0.05	0.10	0.07
	Both		All	0.09	0.10	0.23	0.14
	Other		All	0.04	0.03	0.03	0.03
	All		All	0.12	0.13	0.26	0.17
Hours to catch a legal BKT (<u>all</u> legal fish caught)	All		All	5.8	5.4	2.3	3.7
Estimated total annual BKT harvest ±CI (@95%)		Kenn	I+	70	45	418	533
			II+	100	26	66	192
			III+	N/A	53	0	53
			All	170	124	484	778
		Sourd	I+	163	45	342	550
			II+	42	53	44	139
			III+	N/A	25	31	56
			All	205	123	448	776
		Both	All	375	259	932	1,556
		Other	All	173	97	28	298
		All	All	548	370	959	1,877

Table 9. Clerk creel survey summaries for Egypt, Kimball, and McIntire ponds (con't).

	Brook trout Genetic group	Age	Year 1998	1999	2000	All
Estimated total angler trips ±CI (@95%)			4,605	2,911	4,816	12,332
Estimated total angler trips per acre			31	22	34	29
Estimated weight (Lb/a) of BKT harvested	Kenn	I+	0.10	0.09	1.79	1.98
		II+	0.59	0.16	0.28	1.03
		III+	N/A	0.36	0	0.36
		All	0.69	0.61	2.08	3.38
	Sourd	I+	0.19	0.05	1.06	1.30
		II+	0.07	0.25	0.14	0.46
		III+	N/A	0.15	0.22	0.37
		All	0.26	0.45	1.42	2.13
	Both	All	0.95	1.05	3.49	5.49
	Other	All	0.98	0.51	.	1.49
	All	All	1.91	1.38	3.97	7.26

Table 10. Mean length (mm) and weight (g) by genetic group of brook trout sampled during the **summer** months.

Year	Water	Sampling method	Age	Size variable	Genetic group		
					Kennebago	Sourdnahunk	All
1998	Egypt P	Clerk survey	I+	Length	219±11 (6)	210±3 (15)	213±4 (21)
				Weight	88±16 (6)	72±4 (13)	77±6 (19)
			II+	Length	288±31 (3)	259±17 (2)	276±19 (5)
				Weight	259±17 (2)	160 (1)	210±55 (3)
	Kimball P		II+	Length	330±9 (6)	285±5 (2)	318±10 (8)
				Weight	333±41 (6)		333±41 (6)
	Monroe P (East)	Gillnet	II+	Length	355±16 (2)	353±14 (7)	354±11 (9)
				Weight	535±5 (2)	557±65 (6)	551±48 (8)
1999	Egypt Pond	Clerk survey	I+	Length	206±7 (13)	205±7 (5)	206±5 (18)
				Weight	99±19 (6)	66±8 (4)	86±13 (10)
			II+	Length	370±6 (2)	325 (1)	355±15 (3)
				Weight	655±75 (2)	390 (1)	357±98 (3)
			III+	Length	300±90 (2)	247±57 (2)	274±46 (4)
				Weight	320±250 (2)	176±75 (2)	248±122 (4)
	Kimball Pond	Clerk Survey	III+	Length	335±10 (3)	325 (1)	333±7 (4)
				Weight	343±3 (3)	370 (1)	350±7 (4)
	McIntire Pond	Clerk Survey	II+	Length	329 (1)	323±7 (3)	325±5 (4)
				Weight	400 (1)	325±35 (2)	350±32 (3)
2000	Egypt Pond	Clerk survey	I+	Length	245±4 (36)	227±4 (28)	237±3 (64)
				Weight	116±11 (35)	89±9 (21)	105±7 (56)
			II+	Length	253±21 (4)	259±5 (3)	255±12 (7)
				Weight	149±57 (4)	142±4 (3)	146±31 (7)
			III+	Length		346±13 (2)	346±13 (2)
				Weight		470±5 (2)	470±5 (2)

Table 10. Mean length (mm) and weight (g) by genetic group of brook trout sampled during the **summer** months (con't).

Year	Water	Sampling method	Age	Size variable	Genetic group		
					Kennebago	Sourdnahunk	All
2000 (con't)	Kimball P	Clerk Survey	I+	Length	343 (1)		343 (1)
				Weight	340 (1)		340 (1)
			II+	Length	325±5 (2)		325±5 (2)
				Weight	315±15 (2)		315±15 (2)
	Monroe P (East)	Gillnet	II+	Length	335±3 (5)	311±5 (8)	320±5 (13)
				Weight	421±21 (5)	322±14 (8)	360±18 (13)
2001	Monroe P (West)	Gillnet	II+	Length	292±4 (13)	296±5 (16)	
				Weight	265±12 (12)	286±17 (14)	
All	All	All	I+	Length	235±4 (56)	219±3 (48)	228±3 (104)
				Weight	115±10 (48)	80±5 (38)	100±6 (86)
			II+	Length	318±9 (25)	312±8 (26)	315±6 (51)
				Weight	358±33 (24)	359±37 (21)	358±24 (45)
			III+	Length	321±30 (5)	302±29 (5)	312±20 (10)
				Weight	334±79 (5)	332±29 (5)	333±52 (10)
All	All	All	All	Length	264±6 (86)	255±6 (79)	260±4 (165)
				Weight	205±18 (77)	191±22 (64)	199±14 (141)

Table 11. Mean length (mm), and weight (g) by genetic group of brook trout sampled in the **fall**. Sample sizes in parentheses.

Water(s)	Year sampled	Age	Size variable	Genetic group: Kennebago	Sourdnahunk	All
Broken Bridge P	1999	III+	Length	445 (1)		445 (1)
			Weight	920 (1)		920 (1)
Egypt P	1998	I+	Length	277 (1)	210 (1)	244±34 (2)
			Weight	200 (1)	70 (1)	135±65 (2)
		II+	Length	400 (1)		400 (1)
			Weight	625 (1)		625 (1)
	1999	I+	Length	274±10 (3)	238±8 (7)	247±10 (10)
			Weight	183±32 (2)	93±16 (6)	116±20 (8)
		II+	Length	397 (1)	269±1 (2)	333±65 (3)
			Weight	540 (1)	165 (1)	353±188 (2)
	2000	I+	Length	247±9 (16)	236±8 (13)	238±5 (28)
			Weight	144±22 (16)	114±13 (13)	116±9 (28)
		II+	Length	336 (1)		336 (1)
			Weight	350 (1)		350 (1)
Jaybird P	1997	I+	Length	205±8 (3)	184±6 (5)	192±6 (8)
			Weight	67±12 (3)	38±3 (4)	50±8 (7)
	1998	I+	Length	223±24 (2)	211±7 (3)	216±9 (5)
			Weight	93±23 (2)	57±3 (3)	71±11 (5)
	1999	II+	Length	287 (1)		287 (1)
			Weight	190 (1)		190 (1)
		III+	Length		270 (1)	270 (1)
			Weight		145 (1)	145 (1)

Table 11. Mean length (mm), and weight (g) by genetic group of brook trout sampled in the **fall**. Sample sizes in parentheses (con't).

Water(s)	Year sampled	Age	Size variable	Genetic group: Kennebago	Sourdnahunk	All
Kimball P	1998	I+	Length	254±2 (57)	254±2 (55)	254±2 (112)
			Weight	140±4 (56)	137±4 (54)	139±3 (110)
	1999	I+	Length	266±1 (152)	259±2 (68)	264±1 (220)
			Weight	160±3 (113)	139±4 (55)	152±2 (168)
	1998	II+	Length	305±2 (86)	293±1 (88)	299±1 (174)
			Weight	260±7 (86)	224±5 (85)	242±4 (171)
	1999	II+	Length	321±2 (93)	310±3 (24)	318±2 (117)
			Weight	310±8 (41)	259±12 (18)	295±7 (59)
		III+	Length	362±5 (41)	351±4 (20)	358±4 (61)
			Weight	451±34 (18)	378±38 (7)	430±27 (25)
	2000	I+	Length	271±2 (119)	260±2 (65)	267±1 (184)
			Weight	195±4 (119)	161±5 (65)	183±3 (184)
		II+	Length	323±5 (28)	303±7 (18)	317±4 (46)
			Weight	361±13 (27)	288±23 (18)	332±13 (45)
		III+	Length	369±19 (5)	345±6 (3)	360±12 (8)
			Weight	603±145 (4)	423±16 (3)	526±86 (7)
		IV+	Length	415±22 (4)	350±10 (2)	393±20 (6)
			Weight	894±162 (4)	432±33 (2)	740±142 (6)
	2001	II+	Length	311±4 (37)	293±3 (30)	303±3 (67)
			Weight	278±15 (35)	203±9 (29)	244±10 (64)
		III+	Length	323±38 (4)	270±26 (2)	305±27 (6)
			Weight	331±116 (4)	153±43 (2)	272±83 (6)
		IV+	Length	400 (1)		400 (1)
			Weight	590 (1)		590 (1)

Table 11. Mean length (mm), and weight (g) by genetic group of brook trout sampled in the **fall**. Sample sizes in parentheses (con't).

Water(s)	Year sampled	Age	Size variable	Genetic group Kennebago	Sourdnahunk	All
McIntire P	1998	I+	Length	251±2 (35)	261±2 (50)	257±2 (85)
			Weight	159±5 (35)	172±4 (50)	167±3 (85)
	1999	I+	Length	249±5 (18)	250±3 (45)	250±3 (63)
			Weight	190±11 (18)	194±8 (45)	193±6 (63)
	1999	II+	Length	341±12 (5)	329±3 (8)	333±5 (13)
			Weight	395±50 (5)	379±18 (8)	385±21 (13)
	2000	I+	Length	279±3 (40)	273±3 (55)	276±2 (96)
			Weight	244±7 (40)	239±8 (55)	242±5 (96)
		II+	Length	356±5 (13)	343±4 (10)	350±3 (23)
			Weight	505±22 (13)	452±21 (10)	482±16 (23)
		III+	Length	420±9 (2)	378±7 (3)	395±11 (5)
			Weight	753±43 (2)	625±32 (3)	676±38 (5)
	2001	I+	Length	258±2 (36)	257±3 (37)	256±2 (77)
			Weight	180±5 (36)	193±62 (37)	184±5 (77)
		II+	Length	339±7 (6)	333±7 (7)	297±8 (26)
			Weight	406±32 (6)	368±20 (7)	307±21 (25)
		III+	Length		381±9 (2)	381±9 (2)
			Weight		645±35 (2)	645±35 (2)
Monroe P (East)	1997	I+	Length	274±7 (10)	236±9 (7)	258±7 (17)
			Weight	214±14 (10)	142±21 (7)	184±14 (17)
	1998	II+	Length		381±4 (4)	381±4 (4)
			Weight		653±25 (4)	653±25 (4)
	1999	I+	Length	276±11 (7)	272±6 (9)	274±6 (16)
			Weight	196±16 (7)	204±15 (9)	200±11 (16)
	2001	I+	Length	237±3 (44)	231±4 (22)	235±2 (66)
			Weight	115±4 (43)	102±8 (22)	111±4 (65)

Table 11. Mean length (mm), and weight (g) by genetic group of brook trout sampled in the **fall**. Sample sizes in parentheses (con't).

Water(s)	Year sampled	Age	Size variable	Genetic group Kennebago	Sourdnahunk	All
Monroe P (East) (con't)	2001	III+	Length	396±10 (2)	374±14 (4)	381±10 (6)
			Weight	480±100 (2)	431±42 (4)	448±38 (6)
Monroe P (West)	1998	I+	Length	261±4 (42)	242±2 (24)	254±3 (66)
			Weight	149±7 (42)	110±3 (24)	135±5 (66)
	2000	I+	Length	280±11 (5)	227±4 (4)	256±11 (9)
			Weight	232±30 (5)	103±3 (4)	174±28 (9)
		III+	Length		414 (1)	414 (1)
			Weight		640 (1)	640 (1)
All	All	I+	Length	261±1 (548)	254±1 (456)	258±1 (1,004)
			Weight	170±2 (546)	162±3 (454)	166±2 (1,000)
		II+	Length	316±2 (227)	300±2 (190)	309±1 (417)
			Weight	304±7 (224)	259±8 (186)	284±5 (410)
		III+	Length	361±8 (31)	350±9 (23)	356±6 (54)
			Weight	477±36 (30)	430±34 (23)	456±25 (53)
		IV+	Length	412±17 (5)	350±10 (2)	394±17 (7)
			Weight	833±140 (5)	433±33 (2)	719±122 (7)
All	All	All	Length	281±1 (811)	271±1 (671)	277±1 (1,482)
			Weight	227±5 (679)	199±4 (665)	212±3 (1,470)

Table 12. Mean length (mm) and weight (g) of unmarked brook trout sampled at McIntire Pond. Sample sizes in parentheses.

Year	Age	Length	Weight
2000	II+	252±6 (16)	195±17 (16)
2001	I+	142 (1)	30 (1)
	II+	266±6 (13)	223±18 (12)
	III+	288±7 (11)	270±15 (11)
	IV+	335 (1)	310 (1)

Table 13. T test for differences in sizes of ages I+ and II+ brook trout sampled from study lakes during the fall season, 1998-2001. Significantly larger values and prob>|t|are **bolded**.

Genetic group	Age	Size variable	Value	N	Prob>|t|
Kennebago	I+	Length	**261±1**	548	**0.0001**
Sourdnahunk			254±1	456	
Kennebago	I+	Weight	**170±2**	546	**0.0233**
Sourdnahunk			162±3	454	
Kennebago	I+	Condition	0.929±0.007	549	0.0668
Sourdnahunk			0.950±0.010	454	
Kennebago	II+	Length	**315±2**	227	**0.0001**
Sourdnahunk			300±2	190	
Kennebago	II+	Weight	**304±7**	224	**0.0000**
Sourdnahunk			259±8	186	
Kennebago	II+	Condition	**0.932±0.107**	224	**0.0245**
Sourdnahunk			0.906±0.009	186	
Kennebago	III+	Length	361±8	31	0.3326
Sourdnahunk			350±9	23	
Kennebago	III+	Weight	477±36	30	0.3607
Sourdnahunk			430±34	23	
Kennebago	III+	Condition	0.955±0.026	30	0.8665
Sourdnahunk			0.948±0.032	23	

Table 14. Duncan's multiple range test for differences in sizes of age I+ and age II+ brook trout sampled from study lakes, 1998-2001. Means joined by vertical lines are not significantly different. Sample size in parentheses.

Age I+

Mean length				Mean weight				Mean condition			
Kennebago		Sourdnahunk		Kennebago		Sourdnahunk		Kennebago		Sourdnahunk	
Kimball	A 266	McIntire	A 262	McIntire	A 196	McIntire	A 201	McIntire	A 1.082	McIntire	A 1.111
	A (288)		A (187)		A (129)		A (187)		A (129)		A (187)
	A		A		A						
Monroe	A 263	Kimball	A 258	Kimball	A B 170	Kimball	C B 146	Kimball	B 0.893	Monroe	B 0.893
(West)	A (47)		A (175)		A B (287)		C B (174)		B (287)	(East)	B (38)
	A				B		C		B		B
McIntire	A 261	Monroe	B 242	Monroe	C B 158	Monroe	C 134	Monroe	B 0.887	Kimball	C B 0.846
	A (129)	(East)	B (38)	(West)	C B (47)	(East)	C (38)	(East)	B (60)		C B (174)
			B		C B		C		B		C
Monroe	B 248	Monroe	B 240	Monroe	C B 141	Monroe	C D 109	Monroe	B 0.842	Monroe	C 0.798
(East)	B (61)	(West)	B (28)	(East)	C B (60)	(West)	C D (28)	(West)	B (42)	(West)	C (28)
	B		B		C		D		B		C
Egypt	B 247	Egypt	B 235	Egypt	C 130	Egypt	D 106	Egypt	B 0.830	Egypt	C 0.788
	B (18)		B (20)		C (18)		D (20)		B (18)		C (20)

Age II+

Mean length				Mean weight				Mean condition			
Kennebago		Sourdnahunk		Kennebago		Sourdnahunk		Kennebago		Sourdnahunk	
McIntire	A 348	McIntire	A 336	McIntire	A 457	McIntire	A 405	McIntire	A 1.064	McIntire	A 1.065
	A (24)		A (25)		A (24)		A (25)		A (24)		A (25)
Kimball	B 313	Kimball	B 296	Kimball	B 287	Kimball	B 232	Kimball	B 0.908	Kimball	B 0.078
	B (192)		B (154)		B (189)		B (150)		B (189)		B (150)

Table 15. Mean length (mm), and weight (g) by genetic group of two genetic groups of age I+ brook trout sampled in the **fall**. Sample sizes in parentheses.

Waters	Years	Genetic group	Size variable: Length	Size variable: Weight
Pike Brook Ponds (East and West), Pineo Pond	1988-1992	Domestic (Maine hatchery strain; MHS x Assinica)	**284±2** (355)	**285±9** (347)
Egypt Pond, Kimball Pond, Jaybird Pond, Monroe Ponds (East and West)	1997-2001	Kennebago and Sourdnahunk	257±1 (688)	151±2 (684)
t			42.0146	33.7606
P			**0.0001**	**0.0001**

Table 16. Post-season estimates of brook trout abundance and weight (lb) by genetic group.

Water	Year	Age	Variable	Genetic group: Kennebago	Sourdnahunk	Both	Other[14]	All
Egypt P	2000	I+	Number	29 (17-111)	20 (13-45)	51 (33-117)		
			Number/acre	0.48	0.33	0.85		
			Lb	9.19	5.03	130.55		
			Lb/acre	0.15	0.08	2.18		
		II+	Number	1 captured	0			
			Number/acre					
			Lb	0.77				
			Lb/acre					
		All	Number	34 (20-125)	20 (13-45)	50 (33-101)		42 (31-65)
			Number/acre	0.57	0.33	0.83		0.70
			Lb	10.77	5.03	12.78		
			Lb/acre	0.18	0.08	0.21		
Kimball P	1998	I+	Number	94 (76-125)	97 (77-131)	192 (163-233)		
			Number/acre	1.71	1.76	3.49		
			Lb	28.99	29.27	58.61		
			Lb/acre	0.53	0.53	1.07		
		II+	Number	143 (114-188)	156 (124-210)	298 (253-362)		
			Number/acre	2.60	2.84	5.42		
			Lb	81.77	76.90	158.71		
			Lb/acre	1.49	1.40	2.89		
		All	Number	237 (190-313)	253 (201-341)	490 (416-595)	37 (24-78)	526 (450-631)
			Number/acre	4.31	4.60	8.91	0.67	9.56
			Lb	110.88	105.94	217.37	13.64	233.34
			Lb/acre	2.02	1.93	3.95	0.24	4.24
	1999	I+	Number	235 (178-347)	138 (90-303)	330 (270-425)		
			Number/acre	4.27	2.51	6.78		
			Lb	72.98	41.64	114.62		
			Lb/acre	1.33	0.76	2.09		
		II+	Number	47 (37-64)	25 (15-83)	71 (63-82)		
			Number/acre	0.85	0.45	1.31		
			Lb	32.09	14.26	46.35		
			Lb/acre	0.58	0.26	0.84		

[14]Wild and older-age stocked brook trout of various genetic groups planted prior to initiation of study.

Table 16. Post-season estimates of brook trout abundance and weight (lb) by genetic group (con't).

Water	Year	Age	Variable	Genetic group: Kennebago	Sourdnahunk	Both	Other[15]	All
Kimball P (con't)	1999	III+	Number	16 (12-27)	6 (4-12)	25 (20-32)		
			Number/acre	0.29	0.11	0.40		
			Lb	15.89	5.00	20.89		
			Lb/acre	0.29	0.09	0.38		
		All	Number	237 (201-291)	128 (96-190)	366 (335-405)	12 (8-27)	396 (343-468)
			Number/acre	4.31	2.33	6.64	0.22	
			Lb	120.96	60.90	181.86		
			Lb/acre	2.20	1.11	3.31		
	2000	I+	Number	217 (196-244)	197 (145-310)	389 (339-455)		
			Number/acre	3.95	3.58	7.07		
			Lb	93.30	69.64	156.75		
			Lb/acre	1.70	1.27	2.85		
		II+	Number	37 (27-57)	40 (26-83)	71 (61-85)		
			Number/acre	0.67	0.73	1.29		
			Lb	29.41	25.36	51.87		
			Lb/acre	0.53	0.46	0.94		
		III+	Number	5 (4-6)	4 (3-7)	9 (6-20)		
			Number/acre	0.09	0.07	0.16		
			Lb	6.64	3.73	10.42		
			Lb/acre	0.12	0.07	0.19		
		IV+	Number	10 (7-18)	1 captured	13 (9-28)		
			Number/acre	0.18		0.24		
			Lb	19.67	0.95	19.13		
			Lb/acre	0.36		0.35		
		All	Number	259 (238-284)	229 (181-313)	461 (418-514)	26 (22-33)	477(441-521)
			Number/acre	4.71	4.16	8.38	0.47	8.67
			Lb	149.02	98.73	238.17	5.85	491.77
			Lb/acre	2.71	1.80	4.33	0.11	8.94

[15]Wild and older-age stocked brook trout of various genetic groups planted prior to initiation of study.

Table 16. Post-season estimates of brook trout abundance and weight (lb) by genetic group (con't).

Water	Year	Age	Variable	Genetic group: Kennebago	Sourdnahunk	Both	Other[16]	All
Kimball P (con't)	2000	II+	Number	95	91	185		
			Number/acre	1.73	1.65	3.36		
			Lb	56.93	45.58	102.53		
			Lb/acre	1.04	0.83	1.86		
		III+	Number	16	6	22		
			Number/acre	0.29	0.11	0.40		
			Lb	15.89	5.00	20.89		
			Lb/acre	0.29	0.09	0.38		
		All	Number	276	215	490		
			Number/acre	5.02	3.91	8.91		
			Lb	123.81	86.04	210.04		
			Lb/acre	2.25	1.56	3.82		
	2001	II+	Number	36 (31-43)	41 (34-53)	77		
			Number/acre	0.65	0.75	1.40		
			Lb	22.04	13.82	35.86		
			Lb/acre	0.40	0.25	0.65		
		III+	Number	3 (2-12)	2 captured			
			Number/acre	0.05				
			Lb	40.10				
			Lb/acre	0.73				
		IV+	Number	1 captured				
			Number/acre					
			Lb					
			Lb/acre					
		All	Number	40	43	77	469 (413-544)	
			Number/acre	0.73	0.78	1.40		
			Lb	62.14	13.82	35.86		
			Lb/acre	1.13	0.25	0.65		
	All	I+	Number	165	118	283		
			Number/acre	3.00	2.15	5.15		
			Lb	50.99	35.46	86.62		
			Lb/acre	0.93	0.64	1.57		

[16]Wild and older-age stocked brook trout of various genetic groups planted prior to initiation of study.

Table 16. Post-season estimates of brook trout abundance and weight (lb) by genetic group (con't).

Water	Year	Age	Variable	Genetic group: Kennebago	Sourdnahunk	Both	Other[17]	All
McIntire P	1998	I+	Number	147 (79-1096)	149 (92-382)	307 (180-1041)		
			Number/acre	7.35	7.45	15.35		
			Lb	51.58	56.55	112.86		
			Lb/acre	2.58	2.83	5.64		
		II+	Number				14 (9-26)	
			Number/acre				0.70	
			Lb				12.38	
			Lb/acre				0.62	
		All	Number					252 (181-416)
			Number/acre					12.60
			Lb					107.57
			Lb/acre					5.38
	1999	I+	Number	43 (27-100)	88 (63-142)	129 (93-210)		
			Number/acre	2.15	4.40	6.55		
			Lb	18.04	37.66	55.70		
			Lb/acre	0.90	1.88	2.78		
		II+	Number	14 (8-55)	13 (9-25)	28 (18-58)		
			Number/acre	0.70	0.65	1.35		
			Lb	12.19	10.87	23.06		
			Lb/acre	0.61	0.54	1.15		
		III+	Number				5 (5-5)	
			Number/acre				0.25	
			Lb				7.25	
			Lb/acre				0.36	
		All	Number	56 (42-86)	100 (76-147)	155 (120-218)	5 (5-5)	128 (103-170)
			Number/acre	2.80	5.00	7.8	0.25	8.05
			Lb	30.23	48.53	78.76	7.25	80.01
			Lb/acre	1.51	2.42	3.94	0.36	4.30

[17]Wild and older-age stocked brook trout of various genetic groups planted prior to initiation of study.

Table 16. Post-season estimates of brook trout abundance and weight (lb) by genetic group (con't).

Water	Year	Age	Variable	Genetic group: Kennebago	Sourdnahunk	Both	Other[18]	All
McIntire P (con't)	2000	I+	Number	91 (61-179)	115 (86-173)	207 (156-307)		
			Number/acre	4.55	5.75	10.35		
			Lb	48.99	60.54	110.34		
			Lb/acre	2.45	3.03	5.52		
		II+	Number	16 (12-24)	25	34 (24-55)		
			Number/acre	0.80	1.25	1.70		
			Lb	17.78	24.86	36.06		
			Lb/acre	0.89	1.24	1.80		
		III+	Number	3 (2-3)	4 (3-6)	6		
			Number/acre	0.15	0.20	0.3		
			Lb	4.97	5.51	8.93		
			Lb/acre	0.25	0.28	0.45		
		IV+	Number				1 (1-1)	
			Number/acre				0.05	
			Lb				2.13	
			Lb/acre				0.11	
		All	Number	94 (72-134)	139 (102-219)	232 (187-304)		276 (241-325)
			Number/acre	4.70	6.95	11.6		13.8
			Lb	67.17	87.96	158.01		
			Lb/acre	3.36	4.40	7.90		
	2001	I+	Number	128 (85-259)	158 (102-354)	290 (198-543)		
			Number/acre	6.40	7.90	14.50		
			Lb	50.75	67.17	117.92		
			Lb/acre	2.54	3.38	5.92		
		II+	Number	11 (7-28)	16 (9-73)	27 (16-77)		
			Number/acre	0.55	0.80	1.35		
			Lb	9.81	12.97	22.78		
			Lb/acre	0.49	0.65	1.14		
		III+	Number	0	2 captured	2 captured		
			Number/acre	0				
			Lb	0				
			Lb/acre	0				

[18]Wild and older-age stocked brook trout of various genetic groups planted prior to initiation of study.

Table 16. Post-season estimates of brook trout abundance and weight (lb) by genetic group (con't).

Water	Year	Age	Variable	Genetic group: Kennebago	Sourdnahunk	Both	Other[19]	All
McIntire P (con't)	2001	All	Number	136 (108-184)	183 (130-310)	315 (226-518)	132 (86-285)	452 (357-616)
			Number/acre	6.80	9.15	15.75	6.60	22.60
			Lb	63.04	96.74	159.78	69.20	228.99
			Lb/acre	3.15	4.84	7.99	3.46	11.45
	All (mean)	I+	Number	102	119	219		
			Number/acre	5.11	5.93	10.95		
			Lb	42.34	47.11	84.28		
			Lb/acre	2.12	2.36	4.21		
		II+	Number	14	13 (9-25)	27		
			Number/acre	0.70	0.65	1.35		
			Lb	13.26	10.87	23.06		
			Lb/acre	0.66	0.54	1.15		
		III+	Number	3 (2-3)	4 (3-6)	6		
			Number/acre	0.15	0.20	0.3		
			Lb	4.97	5.51	8.93		
			Lb/acre	0.25	0.28	0.45		
		All	Number	119	136	252		
			Number/acre	5.95	6.80	12.60		
			Lb	60.57	63.49	116.27		
			Lb/acre	3.03	3.17	5.81		
Monroe P (East)	2001	I+	Number	56 (40-92)	23 (20-28)	79		
			Number/acre	5.60	2.30	7.9		
			Lb	14.19	5.17	19.36		
			Lb/acre	1.42	0.52	1.94		
		III+	Number	2 (1-17)	8 (3-8)	10		
			Number/acre	0.20	0.80	1.00		
			Lb	2.11	7.59	9.70		
			Lb/acre	0.21	0.76	0.97		
		All	Number	58	31	86 (74-103)		86 (74-103)
			Number/acre	5.80	3.10	8.60		8.60
			Lb	16.30	12.76	29.06		29.06
			Lb/acre	1.63	1.28	2.91		2.91

[19]Wild and older-age stocked brook trout of various genetic groups planted prior to initiation of study.

Table 16. Post-season estimates of brook trout abundance and weight (lb) by genetic group (con't).

Water	Year	Age	Variable	Genetic group: Kennebago	Sourdnahunk	Both	Other[20]	All
Monroe P (West)	1998	I+	Number	88 (54-232)	110 (46-284)	168 (107-387)		
			Number/acre	6.77	8.46	12.92		
			Lb	28.88	26.65	49.96		
			Lb/acre	2.22	2.05	3.84		
All	1998	I+	Number/acre	5.28	5.89	10.59		
			Lb/acre	1.78	1.80	3.52		
		II+	Number/acre	2.60	2.84	5.42		
			Lb/acre	1.49	1.40	2.89		
		All	Number/acre	7.88	8.73	16.01		
			Lb/acre	3.27	3.20	6.41		
	1999	I+	Number/acre	3.21	3.46	6.67		
			Lb/acre	1.12	1.32	2.44		
		II+	Number/acre	0.78	0.55	1.33		
			Lb/acre	0.60	0.40	1.00		
		III+	Number/acre	0.29	0.11	0.40		
			Lb/acre	0.29	0.09	0.38		
		All	Number/acre	4.28	4.12	8.40		
			Lb/acre	2.01	1.81	3.82		
	2000	I+	Number/acre	2.99	3.22	6.09		
			Lb/acre	1.43	1.46	3.52		
		II+	Number/acre	0.49	0.66	1.00		
			Lb/acre	0.47	0.57	0.91		
		III+	Number/acre	0.08	0.09	0.15		
			Lb/acre	0.12	0.12	0.21		
		IV+	Number/acre	0.09	0	0.12		
			Lb/acre	0.18	0	0.18		
		All	Number/acre	3.65	3.97	7.36		
			Lb/acre	2.20	2.15	4.82		

[20]Wild and older-age stocked brook trout of various genetic groups planted prior to initiation of study.

Table 16. Post-season estimates of brook trout abundance and weight (lb) by genetic group (con't).

Water	Year	Age	Variable	Genetic group: Kennebago	Sourdnahunk	Both	Other[21]	All
All	2001	I+	Number/acre	6.40	7.90	14.50		
			Lb/acre	2.54	3.38	5.92		
		II+	Number/acre	0.60	0.78	1.38		
			Lb/acre	0.45	0.45	0.90		
		III+	Number/acre	0.05				
			Lb/acre	0.73				
		All	Number/acre	7.05	8.68	15.88		
			Lb/acre	3.72	3.83	6.82		
	All	I+	Number/acre	4.47	5.12	9.59		
			Lb/acre	1.72	1.99	3.71		
		II+	Number/acre	1.12	1.21	2.33		
			Lb/acre	0.75	0.71	1.46		
		III+	Number/acre	0.14	0.10	0.24		
			Lb/acre	0.38	0.11	0.49		
		IV+	Number/acre	0.09	0	0.09		
			Lb/acre	0.18	0	0.18		
		All	Number/acre	5.82	6.34	12.16		
			Lb/acre	2.03	2.81	5.84		

[21]Wild and older-age stocked brook trout of various genetic groups planted prior to initiation of study.

Table 17. Chi-square test results for significant differences between the capture rates of Kennebago and Sourdnahunk brook trout from study lakes, 1998-2001. Significant differences bolded for emphasis.

Statistic	Age	Genetic group	Analysis variable	Populaltion variable	Water: Egypt P	Kimball P	McIntire P	East Monroe P	West Monroe P	All
	I+	Kenne-	Number	Stocked	6,200	4,200	800	650	500	12,350
		bago		Captured	75	**329**	129	**61**	**47**	**641**
			Percent		1.21	7.83	16.13	9.38	9.40	5.19
		Sourd-	Number	Stocked	6,200	4,200	800	650	500	12,350
		nahunk		Captured	71	188	**187**	38	28	512
			Percent		1.15	4.48	23.38	5.85	5.60	4.15
X^2					0.111	40.977	13.266	5.784	5.204	15.139
P					0.739	**0.001**	**0.001**	**0.016**	**0.023**	**0.001**
	II+	Kenne-	Number	Stocked	6,200	5,600	600	400	250	13,050
		bago		Captured	17	**252**	25	5	13	**312**
			Percent		0.27	4.50	4.17	1.25	5.20	2.39
		Sourd-	Number	Stocked	6,200	5,600	600	400	250	13,050
		nahunk		Captured	8	162	28	12	16	226
			Percent		0.13	2.89	4.67	3.00	6.40	1.73
X^2					3.247	20.316	0.178	2.945	0.329	14.037
P					0.072	**0.001**	0.673	0.086	0.566	**0.001**
	III+	Kenne-	Number	Stocked	4,400	4,200	400	400	250	9,650
		bago		Captured	2	**30**	2	2	0	36
			Percent		0.05	0.71	0.50	0.50	0	0.37
		Sourd-	Number	Stocked	4,400	4,200	400	400	250	9,650
		nahunk		Captured	4	13	5	4	1	27
			Percent		0.09	0.31	1.25	1.00	0.40	0.28
X^2					0.667	6.756	1.297	0.672	1.002	1.290
P					0.414	**0.009**	0.255	0.412	0.317	0.256
	All	Kenne-	Number	Stocked	8,400	5,600	800	650	500	15,950
		bago		Captured	94	**611**	156	68	60	**989**
			Percent		1.11	10.91	19.50	10.46	12.00	6.20
		Sourd-		Stocked	8,400	5,600	800	650	500	15,950
		nahunk		Captured	83	363	**220**	54	45	765
			Percent		0.99	6.48	27.50	8.31	9.00	4.80
X^2					0.691	69.160	14.240	1.773	2.394	30.271
P					0.406	**0.001**	**0.001**	0.183	0.122	**0.001**

Table 18. Results of Chi-square test for differences between Kennebago and Sourdnahunk brook trout from study lakes, 1998-2001. Percent in parentheses. Significant differences bolded for emphasis.

Age	Genetic group	Population variable and statistic	Number (%)
I+	Kennebago	Mature	**268 (80)**
		Immature	67 (20)
	Sourdnahunk	Mature	184 (57)
		Immature	138 (43)
		X^2	39.964
		P	**0.001**
II+	Kennebago	Mature	168 (99)
		Immature	1 (1)
	Sourdnahunk	Mature	152 (97)
		Immature	4 (3)
		X^2	2.083
		P	0.149
III+	Kennebago	Mature	21 (95)
		Immature	1 (5)
	Sourdnahunk	Mature	15 (88)
		Immature	2 (12)
		X^2	0.704
		P.	0.401
I+	Both	Mature	452 (69)
		Immature	205 (31)
I+	Domestic[22]	Mature	70 (74)
		Immature	21 (26)

[22]Sampled 1988-92.

Table 19. Relative size and proportion of brook trout with hooking injuries sampled during the fall by trapnetting.

Water	Genetic group	Year(s)	Age	Size variable	Hooking injury noted No	Hooking injury noted Yes	Percent With hooking injury
Egypt P	Kennebago	1999-2000	I+	Length	247±9 (16)	277±14 (2)	11.1
				Weight	143±22	188±38 (2)	
				Cond	0.888±0.072	0.874±0.049	
			II+	Length	397 (1)	336 (1)	50.0
				Weight	540	350 (1)	
				Cond	0.863	0.923	
			All	Length	256±12 (17)	296±21 (3)	15.0
				Weight	166±31 (17)	242±58 (3)	
				Cond	0.886±0.067	0.890±0.033	
	Sourdnahunk		I+	Length	236±7 (16)	238±14 (3)	15.8
				Weight	107±11 (16)	113±36 (3)	
				Cond	0.791±0.049	0.784±0.100	
			II+	Length		268 (1)	100.0
				Weight		165 (1)	
				Cond		0.857	
			All	Length	236±7 (16)	246±12 (4)	20.0
				Weight	107±11 (16)	126±28 (4)	
				Cond	0.791±0.049	0.802±0.073	
Kimball P	Kennebago	1998-2001	I+	Length	266±1 (219)	266±2 (71)	24.5
				Weight	171±3 (217)	170±5 (71)	
				Cond	0.895±0.009	0.916±0.039	
			II+	Length	312±2 (123)	314±3 (69)	35.9
				Weight	289±7 (120)	287±9 (58)	
				Cond	0.937±0.016	0.902±0.010	
			III+	Length	354±11 (19)	354±10 (8)	29.6
				Weight	470±48 (19)	417±55 (7)	
				Cond	0.978±0.033	0.928±0.044	
			IV+	Length	450±20 (2)	386±8 (3)	60.0
				Weight	1,150±150 (2)	622±39 (3)	
				Cond	1.255±0.003	1.082±0.086	
			All	Length	287±2 (362)	295±3 (152)	29.6
				Weight	232±7 (357)	245±9 (150)	
				Cond	0.916±0.008	0.917±0.020	
	Sourdnahunk	1998-2001	I+	Length	258±1 (125)	256±3 (50)	28.6
				Weight	145±3 (124)	149±6 (50)	
				Cond	0.835±0.012	0.870±0.019	
			II+	Length	298±2 (100)	292±2 (54)	35.1
				Weight	241±7 (96)	216±5 (54)	
				Cond	0.887±0.012	0.865±0.011	
			III+	Length	325±13 (9)	347±7 (3)	25.0
				Weight	333±44 (9)	408±43 (3)	
				Cond	0.908±0.040	0.972±0.047	
			IV+	Length	340 (1)	360 (1)	50.0
				Weight	400 (1)	465 (1)	
				Cond	1.018	0.997	

Table 19. Relative size and proportion of brook trout with hooking injuries sampled during the fall by trapnetting (con't).

Water	Genetic group	Year(s)	Age	Size variable	Hooking injury noted: No	Hooking injury noted: Yes	Percent with hooking injury
Kimball P (con't)	Sourdnahunk	1998-2001	All	Length	278±2 (235)	277±3 (107)	31.3
				Weight	194±5 (230)	193±7 (107)	
				Cond	0.860±0.008	0.872±0.010	
McIntire P	Kennebago	1998-2001	I+	Length	261±2 (127)	264±1 (2)	1.6
				Weight	196±5 (127)	200±0 (2)	
				Cond	1.086±0.013	1.093±0.006	
			II+	Length	346±6 (23)	311 (1)	4.2
				Weight	463±20 (23)	310 (1)	
				Cond	1.151±0.088	1.031	
			III+	Length	420±9 (2)	(0)	0
				Weight	753±43 (2)		
				Cond	1.015±0.008		
			All	Length	276±3 (152)	279±16 (3)	1.9
				Weight	244±10 (152)	237±37 (3)	
				Cond	1.095±0.017	1.072±0.021	
	Sourdnahunk	1998-2001	I+	Length	262±2 (180)	250±7 (7)	3.7
				Weight	202±4 (180)	169±21 (7)	
				Cond	1.112±0.012	1.056±0.058	
			II+	Length	335±3 (23)	338±1 (2)	8.0
				Weight	410±15 (23)	383±13 (2)	
				Cond	1.077±0.019	0.995±0.037	
			III+	Length	379±5 (5)	(0)	0
				Weight	633±21 (5)		
				Cond	1.158±0.012		
			All	Length	273±2 (208)	269±14 (9)	4.1
				Weight	235±7 (208)	216±35 (9)	
				Cond	1.109±0.011	1.043±0.046	
All	Kennebago	All	I+	Length	263±1 (361)	267±2 (76)	17.4
				Weight	178±3 (359)	175±5 (76)	
				Cond	0.960±0.009	0.927±0.037	
			II+	Length	317±2 (147)	315±3 (71)	32.6
				Weight	319±9 (144)	288±8 (70)	
				Cond	0.971±0.020	0.904±0.010	
			III+	Length	360±10 (21)	354±10 (8)	27.6
				Weight	497±47 (21)	417±55 (7)	
				Cond	0.982±0.030	0.928±0.044	
			IV+	Length	450±20 (2)	386±8 (3)	60.0
				Weight	1,150±150 (2)	622±39 (3)	
				Cond	1.255±0.003	1.082±0.086	
			All	Length	283±2 (531)	295±3 (158)	23.8
				Weight	233±6 (526)	245±9 (156)	
				Cond	0.965±0.008	0.920±0.019	
	Sourdnahunk	All	I+	Length	259±1 (321)	254±2 (59)	15.5
				Weight	175±3 (320)	149±6 (59)	
				Cond	0.989±0.012	0.889±0.019	

Table 19. Relative size and proportion of brook trout with hooking injuries sampled during the fall by trapnetting (con't).

Water	Genetic group	Year(s)	Age	Size variable	Hooking injury noted No	Hooking injury noted Yes	Percent with hooking injury
All (con't)	Sourdnahunk	All	II+	Length	305±2 (123)	293±2 (57)	31.7
				Weight	273±9 (119)	221±6 (57)	
				Cond	0.924±0.012	0.870±0.011	
			III+	Length	345±11 (14)	347±7 (3)	17.6
				Weight	440±49 (14)	408±43 (3)	
				Cond	0.997±0.042	0.972±0.047	
			IV+	Length	340 (1)	360 (1)	50.0
				Weight	400 (1)	465 (1)	
				Cond	1.018	0.997	
			All	Length	274±2 (459)	276±3 (120)	20.7
				Weight	209±4 (454)	193±7 (120)	
				Cond	0.972±0.009	0.883±0.011	
All	All	All	I+	Length	260±1 (694)	261±2 (136)	16.4
				Weight	176±2 (691)	163±4 (133)	
				Cond	0.977±0.007	0.910±0.023	
			II+	Length	306±2 (299)	305±2 (130)	30.3
				Weight	290±6 (291)	258±6 (128)	
				Cond	0.971±0.012	0.892±0.008	
			III+	Length	344±7 (49)	344±9 (13)	21.0
				Weight	455±29 (49)	393±35 (12)	
				Cond	1.036±0.022	0.967±0.032	
			IV+	Length	401±27 (5)	380±9 (4)	44.4
				Weight	795±189 (5)	583±48 (4)	
				Cond	1.110±0.084	1.061±0.065	
All	All	All	All	Length	275±1 (1,115)	287±2 (297)	21.0
				Weight	220±4 (1,098)	223±6 (294)	
				Cond	0.977±0.006	0.912±0.012	

Table 20. Test results for significant differences between the capture rates by netting of Kennebago and Sourdnahunk brook trout from study lakes, 1998-2001. Sample size in parentheses. Significant differences bolded for emphasis.

Test and statistics	Genetic group	Age	Analysis variable	Hooking injury observed	All
T test	Both	I+	Condition	Yes	0.910±0.262 (136)
				No	**0.977±0.189** (691)
T value					3.561
P					**0.004**
	Both	II+	Condition	Yes	0.892±0.090 (128)
				No	**0.971±0.207** (291)
T value					**4.148**
P					**0.001**
	Both	III+	Condition	Yes	0.967±0.112 (12)
				No	1.036±0.153 (49)
T value					1.482
P					0.144
Chi-square	Kennebago	I+	Number	Yes	76 (17)
				No	361 (83)
	Sourdnahunk	I+	Number	Yes	59 (16)
				No	321 (84)
X^2					0.513
P					0.474
Chi-square	Kennebago	II+	Number	Yes	71 (33)
				No	147 (67)
	Sourdnahunk	II+	Number	Yes	57 (32)
				No	123 (68)
X^2					0.037
P					0.848
Chi-square	Kennebago	III+	Number	Yes	8 (28)
				No	21 (72)
	Sourdnahunk	III+	Number	Yes	3 (18)
				No	14 (82)
X^2					0.582
P					0.446

Table 20. Test results for significant differences between the capture rates by netting of Kennebago and Sourdnahunk brook trout from study lakes, 1998-2001. Sample size in parentheses. Significant differences bolded for emphasis (con't).

Test and statistics	Genetic group	Age	Analysis variable	Hooking injury observed	All (%)
Chi-square	Kennebago	All	Number	Yes	158 (23)
				No	459 (77)
	Sourdnahunk	All	Number	Yes	120 (21)
				No	251 (79)
X^2					0.895
P					0.344
Chi-square	Both, Kimball P (Artifcial lures only)	I+	Number	Yes	122 (26)
				No	343 (74)
	Both, McIntire P (Fly fishing only)	I+	Number	Yes	9 (3)
				No	319 (97)
X^2					76.972
P					**0.001**
Chi-square	Both, Kimball P	II+	Number	Yes	123 (36)
				No	223 (64)
	Both, McIntire P	II+	Number	Yes	5 (6)
				No	75 (94)
X^2					26.537
P					**0.001**

Table 21. Growth increments (mm) of brook trout stocked at study ponds by water, genetic group, and age. Sample size in parentheses.

Water	Genetic group	Year stocked	Rearing station	Age when sampled	Size variable	Mean size when stocked	Months post stocking	Mean size when sampled	Growth increment Total	Growth increment Per month
Egypt P	Kenne-bago	2000	Embden	I+	Length	217	6	247±9 (16)	30	5
					Weight	104	6	144±22 (16)	40	7
	Sourd-nahunk	2000	Embden	I+	Length	195	6	236±8 (13)	41	7
					Weight	81	6	114±13 (13)	33	6
Kimball P	Kenne-bago	1999	Embden	I+	Length	150	12	271±2 (119)	121	10
					Weight	33	12	195±4 (119)	162	14
				II+	Length	150	24	311±4 (37)	161	7
					Weight	33	24	278±15 (35)	245	10
		1998	Embden	I+	Length	157±2 (120)	12	266±1 (152)	109	9
					Weight	37 (120)	12	160±3 (133)	123	10
				II+	Length	157±2 (120)	24	323±5 (28)	166	7
					Weight	37 (120)	24	361±13 (27)	324	14
				III+	Length	157±2 (120)	36	323±38 (4)	166	5
					Weight	37 (120)	36	331±116 (4)	294	8
		1997	Embden	I+	Length	149±2 (60)	12	254±2 (57)	105	9
					Weight	31 (60)	12	140±4 (56)	109	9
				II+	Length	149±2 (60)	24	321±2 (93)	172	7
					Weight	31 (60)	24	310±8 (41)	279	12

Table 21. Growth increments (mm) of brook trout stocked at study ponds by water, genetic group, and age. Sample size in parentheses (con't).

Water	Genetic group	Year stocked	Rearing station	Age when sampled	Size variable	Mean size when stocked	Months post stocking	Mean size when sampled	Growth increment Total	Growth increment Per month
Kimball P (con't)	Kenne-bago	1997	Embden	III+	Length	149±2 (60)	36	369±19 (5)	220	6
					Weight	31 (60)	36	603±145 (4)	572	16
				IV+	Length	149±2 (60)	48	400 (1)	251	5
					Weight	31 (60)	48	590 (1)	559	12
		1996	Palermo	II+	Length	**139**[23]	24	305±2 (86)	166	7
					Weight	29 (30)	24	260±7 (86)	231	19
				III+	Length	**139**	36	362±5 (41)	223	6
					Weight	29 (30)	36	451±34 (41)	422	12
				IV+	Length	**139**	48	415±22 (4)	276	6
					Weight	29 (30)	48	894±162 (4)	865	18
	Sourd-nahunk	1999	Embden	I+	Length	143	12	260±12 (65)	117	10
					Weight	32	12	161±5 (65)	129	11
				II+	Length	143	24	293±3 (30)	150	6
					Weight	32	24	203±9 (29)	171	7

[23]Bolded numbers represent estimated sizes determined from "Hatchery fish mean total length and number per weight, brook trout and rainbow trout", prepared by Owen Fenderson, May 30, 1975.

Table 21. Growth increments (mm) of brook trout stocked at study ponds by water, genetic group, and age. Sample size in parentheses (con't).

Water	Genetic group	Year stocked	Rearing station	Age when sampled	Size variable	Mean size when stocked	Months post stocking	Mean size when sampled	Growth increment Total	Growth increment Per month
Kimball P (con't)	Sourd-nahunk	1998	Embden	I+	Length	163±2 (120)	12	259±2 (68)	96	8
					Weight	45 (120)	12	139±4 (55)	94	8
				II+	Length	163±2 (120)	24	303±7 (18)	140	6
					Weight	45 (120)	24	288±23 (18)	243	10
				III+	Length	163±2 (120)	36	270±26 (2)	107	3
					Weight	45 (120)	36	153±43 (2)	108	3
		1997	Embden	I+	Length	174±3 (60)	12	254±2 (55)	80	7
					Weight	54±3 (60)	12	137±4 (54)	83	7
				II+	Length	174±3 (60)	24	310±3 (24)	136	6
					Weight	54±3 (60)	24	259±12 (18)	205	9
				III+	Length	174±3 (60)	36	345±6 (3)	171	5
					Weight	54±3 (60)	36	423±16 (3)	369	10
		1996	Enfield	II+	Length	133 (30)	24	293±1 (83)	160	7
					Weight	18 (30)	24	224±5	206	9
				III+	Length	133 (30)	36	351±4 (20)	218	6
					Weight	18 (30)	36	378±38 (7)	360	10
				IV+	Length	133 (30)	48	350±10 (2)	217	5
					Weight	18 (30)	48	432±33 (2)	414	9

Table 21. Growth increments (mm) of brook trout stocked at study ponds by water, genetic group, and age. Sample size in parentheses (con't).

Water	Genetic group	Year stocked	Rearing station	Age when sampled	Size variable	Mean size when stocked	Months post stocking	Mean size when sampled	Growth increment Total	Growth increment Per month
McIntire P	Kenne-bago	2001	Embden	I+	Length		6	258±2 (36)		
					Weight		6	180±5 (36)		
		2000	Embden	I+	Length	217	6	279±3 (40)	62	10
					Weight	104	6	244±7 (40)	140	23
				II+	Length	217	18	339±7 (6)	122	7
					Weight	104	18	406±32 (6)	302	17
		1999	Embden	I+	Length	187 (90)	6	249±5 (18)	62	10
					Weight	65 (90)	6	190±11 (18)	125	21
				II+	Length	187 (90)	18	356±5 (13)	169	9
					Weight	65 (90)	18	505±22 (13)	440	24
		1998	Embden	I+	Length	191±3 (30)	6	251±2 (35)	60	10
					Weight	**76**	6	159±5	83	14
				II+	Length	191±3 (30)	18	341±12 (5)	150	8
					Weight	**76**	18	395±50 (5)	319	18
				III+	Length	191±3 (30)	30	420±19 (2)	229	8
					Weight	**76**	30	753±43 (2)	677	23
	Sourd-	2001	Embden	I+	Length		6	257±3 (37)		
					Weight		6	193±62 (37)		

Table 21. Growth increments (mm) of brook trout stocked at study ponds by water, genetic group, and age. Sample size in parentheses (con't).

Water	Genetic group	Year stocked	Rearing station	Age when sampled	Size variable	Mean size when stocked	Months post stocking	Mean size when sampled	Growth increment Total	Growth increment Per month
McIntire P (con't)	Sourd-nahunk	2000	Embden	I+	Length	195	6	273±3 (55)	78	13
					Weight	81	6	239±8 (55)	158	26
				II+	Length	195	18	368±20 (7)	173	10
					Weight	81	18	381±20 (2)	300	17
		1999	Embden	I+	Length	203 (60)	6	250±3 (45)	47	8
					Weight	82 (60)	6	194±8 (45)	112	19
			Embden	II+	Length	203 (60)	18	343±4 (10)	140	8
					Weight	82 (60)	18	452±21 (10)	370	21
				III+	Length	203 (60)	30	381±9 (2)	178	6
					Weight	82 (60)	30	645±35 (2)	563	19
		1998	Embden	I+	Length	208±3 (60)	6	261±2 (50)	53	9
					Weight	**99**	6	172±4 (50)	73	12
			Embden	II+	Length	208±3 (60)	18	329±3 (8)	121	7
					Weight	**99**	18	379±18 (8)	280	16
				III+	Length	208±3 (60)	30	378±7 (3)	170	3
					Weight	**99**	30	625±32 (3)	526	18

Table 21. Growth increments (mm) of brook trout stocked at study ponds by water, genetic group, and age. Sample size in parentheses (con't).

Water	Genetic group	Year stocked	Rearing station	Age when sampled	Size variable	Mean size when stocked	Months post stocking	Mean size when sampled	Growth increment Total	Growth increment Per month
Monroe P (East)	Kenne-bago	2000		I+	Length		12	237±3 (44)		
					Weight		12	115±4 (43)		
				III+	Length		36	396±10 (2)		
					Weight		36	480±100 (2)		
		1998		I+	Length		12	276±11 (7)		
					Weight		12	196±16 (7)		
		1996		I+	Length		12	274±7 (10)		
					Weight		12	214±14 (10)		
	Sourd-nahunk	2000		I+	Length		12	231±4 (22)		
					Weight		12	102±8 (22)		
		1998		I+	Length		12	272±6 (9)		
					Weight		12	204±15 (9)		
		1996		I+	Length		12	236±9 (7)		
					Weight		12	142±21 (7)		
				II+	Length		24	381±4 (4)		
					Weight		24	653±25 (4)		

Table 21. Growth increments (mm) of brook trout stocked at study ponds by water, genetic group, and age. Sample size in parentheses (con't).

Water	Genetic group	Year stocked	Rearing station	Age when sampled	Size variable	Mean size when stocked	Months post stocking	Mean size when sampled	Growth increment Total	Growth increment Per month
Monroe P (West)	Kenne-bago	1999	Embden	I+	Length		12	280±11 (5)		
					Weight		12	232±30 (5)		
		1997	Embden	I+	Length	149±2 (60)	12	261±4 (42)	112	9
					Weight	31 (60)	12	149±7 (42)	118	10
	Sourd-nahunk	1999		I+	Length		12	227±4 (4)		
					Weight		12	103±3 (4)		
		1997	Embden	I+	Length	174±3 (60)	12	242±2 (24)	68	6
					Weight	54±3 (60)	12	110±3 (24)	56	5
				III+	Length	174±3 (60)	36	414 (1)	240	7
					Weight	54±3	36	640	586	16

Table 22. Summary of brook trout incremental growth for all waters by genetic group, rearing station, and age. Sample size in parentheses.

Genetic group	Rearing station	Brood year	Age at stocking	Size variable	Mean size when stocked	Size at months post stocking							
						6	12	18	24	30	36	42	48
Kenne-bago	Palermo	1995	FF	Length	**139**		258±10 (13)		306±2 (87)		362±8 (19)		415±22 (4)
				Increment			119		48		56		53
				Weight	29 (30)		180±21 (13)		261±8 (87)		451±34 (18)		894±162 (4)
				Increment			151		81		190		443
	Embden	1996	FF	Length	149±2 (60)		257±2 (102)		323±3 (43)		369±19 (5)		
				Increment			108		66		46		
				Weight	31 (60)		144±4 (101)		313±10 (43)		603±145 (4)		
				Increment			113		169		290		
			SY	Length	191±3 (30)	251±2 (35)		341±12 (5)		420±9 (2)			
				Increment		60		90		79			
				Weight	**76**[24]	159±5 (35)		395±50 (5)		753±43 (2)			
				Increment		83		236		358			
		1997	FF	Length	157±2 (120)		268±1 (121)		328±3 (30)		323±38 (4)		
				Increment			111		60		-4		
				Weight	37 (120)		161±3 (121)		363±12 (29)		331±116 (4)		
				Increment			124		202		-32		

[24]Estimated (see previous footnote).

Table 22. Summary of brook trout incremental growth for all waters by genetic group, rearing station, and age. Sample size in parentheses (con't).

Genetic group	Rearing station	Brood year	Age at stocking	Size variable	Mean size when stocked	Size at months post stocking 6	12	18	24	30	36	42	48
Kenne-bago	Embden	1997	SY	Length	187 (90)	249±5 (18)		356±5 (13)					
				Increment		62		107					
				Weight	65 (90)	190±11 (18)		505±22 (13)					
				Increment		125		315					
		1998	FF	Length	150		268±4 (55)		311±4 (37)				
				Increment			118		43				
				Weight	33		210±10 (55)		278±15 (35)				
				Increment			177		68				
			SY	Length	217	273±2 (159)		339±7 (6)					
				Increment		56		66					
				Weight	104	207±3 (159)		406±32 (6)					
				Increment		103		199					
	Enfield	1998	FF	Length			280±11 (5)						
				Weight			232±30 (5)						
				Increment									
	All	All	FF	Length	151 (210)		262 (251)		313 (179)		362±5 (41)		
				Increment			109		60		54		
				Weight	34 (210)		154 (250)		276 (179)		451±34 (41)		
				Increment			119		136		167		

Table 22. Summary of brook trout incremental growth for all waters by genetic group, rearing station, and age. Sample size in parentheses (con't).

Genetic group	Rearing station	Brood year	Age at Stocking	Size variable	Mean size when stocked	Size at months post stocking							
						6	12	18	24	30	36	42	48
Kenne-bago	All	All	SY	Length	188 (120)	250 (53)	341 (5)						
				Increment		61	89						
				Weight	68 (120)	170 (53)	395 (5)						
				Increment		104	287						
Sourd-nahunk	Enfield	1995	FF	Length	133 (30)		214±9 (12)		293±1 (88)		333±12 (8)		350±10 (2)
				Increment			81		79		40		17
				Weight	18 (30)		104±21 (11)		224±4 (85)		349±44 (8)		433±33 (2)
				Increment			86		120		125		84
	Embden	1996	FF	Length	174±3 (60)		248±2 (83)		310±3 (24)		363±18 (4)		350±10 (2)
				Increment			74		56		53		-13
				Weight	54±3 (60)		126±4 (82)		306±4 (19)		478±55 (4)		432±33 (2)
				Increment			72		252		172		-46
			SY	Length	208±3 (60)	261±2 (50)		329±3 (8)		378±7 (3)			
				Increment		53		68		49			
				Weight	**99**	172±4 (50)		379±18 (8)		625±32 (3)			
				Increment		73		134		246			

Table 22. Summary of brook trout incremental growth for all waters by genetic group, rearing station, and age. Sample size in parentheses (con't).

Genetic group	Rearing station	Brood year	Age at stocking	Size variable	Mean size when stocked	Size at months post stocking 6	12	18	24	30	36	42	48
Sourd-nahunk	Embden	1997	FF	Length	163±2 (120)		259±2 (70)		303±7 (18)		270±26 (2)		
				Increment			96		44		-33		
				Weight	45 (120)		143±5 (70)		288±23 (18)		153±43 (2)		
				Increment			98		145		-135		
			SY	Length	203 (60)	250±3 (45)		343±4 (10)		381±9 (2)			
				Increment		47		93		38			
				Weight	82 (60)	194±8 (45)		452±21 (10)		645±35 (2)			
				Increment		112		258		193			
		1998	FF	Length	143		266±3 (68)		293±3 (30)				
				Increment			123		27				
				Weight	32		214±9 (68)		203±9 (29)				
				Increment			182		-11				
			SY	Length	195	266±2 (120)		333±7 (7)					
				Increment		71		138					
				Weight	81	197±6 (120)		368±20 (7)					
				Increment		116		171					

Table 22. Summary of brook trout incremental growth for all waters by genetic group, rearing station, and age. Sample size in parentheses (con't).

Genetic group	Rearing station	Brood year	Age at Stocking	Size variable	Mean size when stocked	Size at months post stocking 6	12	18	24	30	36	42	48
Sourd-Nahunk	Enfield	1998	FF	Length			227±4 (4)						
				Weight			103±3 (4)						
				Increment									
	All	All	FF	Length	162 (210)		254 (202)		297 (112)		351±4 (20)		
				Increment			98		50		70		
				Weight	44 (210)		134 (187)		230 (103)		378±38 (7)		
				Increment			96		110		154		
			SY	Length	206 (120)	256 (95)		329±3 (8)					
				Increment		50		71					
				Weight	91 (120)	182 (95)		379±18 (8)					
				Increment		92		115					

Table 23. Relative trapnet capture rates of Kennebago, Sourdnahunk, and domestic (Maine Hatchery and F_1 strains) hatchery-reared brook trout, 1996-2001.

Waters sampled	Reg. sev.	Competition category	Age at stocking[25]	Age at sampling	Genetic group	Number stocked	Captured	
							Number	Percent
Kimball	High	Low	FF	I+	Kennebago	5,600	328	5.9
					Sourdnahunk	5,600	188	3.4
					Both	11,200	516	4.6
				II+	Kennebago	4,200	151	3.6
					Sourdnahunk	4,200	136	3.2
					Both	8,400	287	3.4
				III+	Kennebago	2,800	50	1.8
					Sourdnahunk	2,800	25	0.9
					Both	5,600	75	1.3
				IV+	Kennebago	1,400	5	0.4
					Sourdnahunk	1,400	2	0.1
					Both	2,800	7	0.3
McIntire	High	Low	SY	I+	Kennebago	800	129	16.1
					Sourdnahunk	800	187	23.4
					Both	1,600	316	19.8
				II+	Kennebago	600	24	4.0
					Sourdnahunk	600	43	7.2
					Both	1,200	67	5.6
				III+	Kennebago	400	2	0.5
					Sourdnahunk	400	5	1.3
					Both	800	7	0.9
Monroe P, (East)	Mod	Low		I+	Kennebago	650	61	9.4
					Sourdnahunk	650	38	5.8
					Both	1,350	99	15.2
				II+	Kennebago	150	0	0
					Sourdnahunk	150	4	2.7
					Both	300	4	1.3
				III+	Kennebago	500	2	0.4
					Sourdnahunk	500	4	0.8
					Both	1,000	6	0.6
Monroe P, (West)	Mod	Low		I+	Kennebago	500	47	9.4
					Sourdnahunk	500	28	5.6
					Both	1,000	75	7.5
				III+	Kennebago	250	0	0
					Sourdnahunk	250	1	0.4
					Both	500	1	0.4

[25] FF = fall fingerling (6 months old); SY = spring yearling (1 year old)

Table 23. Relative trapnet capture rates of Kennebago, Sourdnahunk, and domestic (Maine Hatchery and F_1 strains) hatchery-reared brook trout, 1996-2001 (con't).

Waters sampled	Reg. sev.	Competition category	Age at stocking[26]	Age at sampling	Genetic group	Number stocked	Captured	
							Number	Percent
Jaybird	Mod.	Mod	FF	I+	Kennebago	1,050	5	0.5
					Sourdnahunk	1,050	8	0.8
					Both	2,100	13	0.6
				II+	Kennebago	700	1	0.1
					Sourdnahunk	700	0	0
					Both	1,400	1	0.1
				III+	Kennebago	350	0	0
					Sourdnahunk	350	1	0.3
					Both	700	1	0.1
Broken Bridge	High	High	FF	I+	Kennebago	1,200	0	0
					Sourdnahunk	1,200	0	0
					Both	2,400	0	0
				II+	Kennebago	800	0	0
					Sourdnahunk	800	0	0
					Both	1,600	0	0
				III+	Kennebago	400	1	0.3
					Sourdnahunk	400	0	0
					Both	800	1	0.1
Egypt	Mod.	Severe	FF	I+	Kennebago	6,200	4	<0.1
					Sourdnahunk	6,200	8	0.1
					Both	12,400	12	0.1
			SY	I+	Kennebago	2,200	16	0.7
					Sourdnahunk	2,200	13	0.6
					Both	4,400	29	0.7
			FF	II+	Kennebago	6,200	3	<0.1
					Sourdnahunk	6,200	2	<0.1
					Both	12,400	5	<0.1
			FF	III+	Kennebago	4,400	0	0
					Sourdnahunk	4,400	0	0
					Both	8,800	0	0
			FF	IV+	Kennebago	2,200	0	0
					Sourdnahunk	2,200	0	0
					Both	4,400	0	0
Pike Brook Ponds (East and West); Pineo Pond[27]	Low	Low	FF	I+	Domestic	5,500	355	6.4
			FF	II+	Domestic	5,500	16	0.3

[26] FF = fall fingerling (6 months old); SY = spring yearling (1 year old)

[27] Data collected 1988-90.

Table 24. Relative abundance of brook trout and competing species captured during post-season in study waters.

Competition	Water	Year	Fish caught	BKT	Competing species									All	Percent brook trout
					WHS	MIN	SLT	PKS	SKB	BUL	PKL	SMB	EEL		
Low	McIntire P	1998	No	96		590								686	14
			Lb	41		68								109	38
		1999	No	169		644								813	21
			Lb	95		161								256	37
		2000	No	207		92								299	69
			Lb	85		11								96	89
		2001	No	180		167								347	52
			Lb	91		21								112	81
		Mean	**No**	**163**		**373**								**536**	**30**
			Lb	**78**		**65**								**143**	**55**
Moderate	Jaybird P	1997	No	23		13				2791			3	2830	1.8
			Lb	3		<1				123			8	134	2
		1998	No	20	2	4		4		1672				1702	1
		Mean	**No**	**22**		**9**		**2**		**2232**			**2**	**2266**	**1**
High	Broken Bridge P	1997	No	3		11		243		1181	8		3	1449	<1
			Lb	<1		<1		5		114	3		5	127	<1
Severe	Egypt P	1998	No	4	114	7	10	19		1036			2	1192	<1
			Lb	2.41	69.26	.	.	.		126.89			.	199	1
		1999	No	11	190	195	342	951		2220			2	3911	<1
			Lb	3.96	139.78	20[28]	37.67	23.25		82.15			.	307	1
		Mean	**No**	**8**	**152**	**101**	**176**	**485**		**1628**			**2**	**2552**	**<1**
			Lb	**3.19**	**104.52**	**10**	**19.39**	**11.86**		**104.52**			**.**	**253**	**1**

[28]Estimated.

Table 25. Population estimates of competing fish species, brook trout study ponds.

Year	Species	Water	Population estimate	Per acre	
				No.	Weight (lb)
1997	Bullhead	Broken Bridge P	4,733 (3,759-6,389)	237	.
		Jaybird P	13,354 (11,369-16,178)	954	.
1999	Creek chub	McIntire P	1,131 (947-1,405)	57	14.3
2000	Creek chub	McIntire P	276 (241-325)	14	1.6

Appendix 1. Percent eye-up of eggs from Phillips Hatchery brook trout brood, 1976-99.

	Genetic group					
Year	MHS	Maine Hatchery/ Assinica	Assinica/ Tomah	Assinica	Kennebago	Sourdnahunk
1976	86					
1977	65					
1978	42					
1979	65	73				
1980	62	80				
1981	74	79				
1982	82	89				
1983	86	89				
1984	78	76	59			
1985	76	36	52			
1986	85		34			
1987	75	46	24			
1988	42	22	14			
1989	26	38	14			
1990	63		60			
1991	27	36				
1992		60				
1993		45				
1994	20	34				
1995	24			48	76	80
1996	37			41	92	91
1997	27			57	77	75
1998	49				82	60[29]
1999[30]					63	63
2000					60	56

[29]Future brood lot 89% eye-up; Production lot 31% eye-up; mean = 60%.

[30]1999 was the first year of using hatchery broodstock to make future brood.

Appendix 2. Ratings of fish species as brook trout competitors.

Species	Species code	Rating	Category
Stickleback species	SKB	0.1	Low
Slimy sculpin	SCL	0.1	
Finescale dace	FSD	0.2	
Blacknose dace	BND	0.2	
Northern redbelly dace	NRD	0.2	
Blacknose shiner	BNS	0.3	
Pearl dace	PRD	0.3	
Common shiner	CMS	0.3	
Fathead minnow	FHM	0.4	Moderate
Banded killifish	BKF	0.4	
Lake whitefish	LWF	0.4	
Burbot	CSK	0.4	
Lake trout	LKT	0.4	
Golden shiner	GLS	0.5	
Lake chub	LCB	0.5	
American eel	EEL	0.6	High
Rainbow smelt	SLT	0.6	
Longnose sucker	LNS	0.6	
Pumpkinseed sunfish	PKS	0.6	
Creek chub	CCB	0.7	
Largemouth bass	LMB	0.9	
White sucker	WHS	0.9	Severe
Brown bullhead	BUL	0.9	
Chain Pickerel	PKL	1.0	

COOPERATIVE

STATE FEDERAL

PROJECT

This report has been funded in part by the Federal Aid in Sport Fish Restoration Program. This is a cooperative effort involving federal and state government agencies. The program is designed to increase sport fishing and boating opportunities through the wise investment of anglers' and boaters' tax dollars in state sport fishery projects. This program which was funded in 1950 was named the Dingell-Johnson Act in recognition of the congressmen who spearheaded this effort. In 1984 this act was amended through the Wallop-Breaux Amendment (also named for the congressional sponsors) and provided a threefold increase in Federal monies for sportfish restoration, aquatic education and motorboat access.

The Program is an outstanding example of a "user pays-user benefits", or "user fee" program. In this case, anglers and boaters are the users. Briefly, anglers and boaters are responsible for payment of fishing tackle excise taxes, motorboat fuel taxes, and import duties on tackle and boats. These monies are collected by the sport fishing industry, deposited in the Department of Treasury, and are allocated the year following collection to state fishery agencies for sport fisheries and boating access projects. Generally, each project must be evaluated and approved by the U.S. Fish and Wildlife Service (USFWS). The benefits provided by these projects to users complete the cycle between "user pays — user benefits".

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